उत्तराखण्ड शासन

UTTARAKHAND

ECONOMIC SURVEY

2019-20

VOLUME - II

DIRECTORATE OF ECONOMICS & STATISTICS

GOVERNMENT OF UTTARAKHAND

100/06, NEHSHVILLA ROAD, GATE NO. 4, DEHRADUN, UTTARAKHAND

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Table of Contents

Sushil Kumar
Director

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Directorate of Economicsand Statistics (DES),
Department of Planning
Govt. Of Uttarakhand
dirdesuk@gmail.com
0135 2655571, 2655572

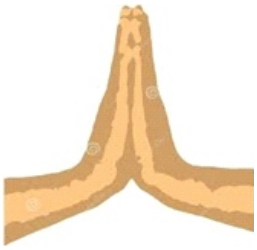
Foreword

The Directorate of Economics and Statistics (DES), Department of Planning, Government of Uttarakhand brings out the Economic Survey of the State, providing an overview of the performance of the State's economy during the previous year.

This is the third edition of Volume II of the Economic Survey of Uttarakhand reflecting on various aspects of State economy, macro-economic aggregates, analytical review of important sectors of the economy, growth drivers andgrowth prospects of the State in key areas such as agriculture and allied sub-sectors such as horticulture, tourism, MSMEs, civil aviation. The report lays out important policy and programmatic issues and challenges in various aspects of the State's economy. Policy outlook in view of the COVID-19 pandemic is discussed in this report with an action agenda.

On behalf of the Directorate of Economics and Statistics, I congratulate Mr Deepak Bhandari and his whole team from EHI International consisting of Prof. Baharul Islam, Dr Mahendra Babu Kuruva, Dr. Namit Chaudhary, Prof. Atulan Guha, Dr Subir Sen, Prof. Vaibhav Bharmoria, Prof. Ram K Dhurkari,Mr Nitesh Kaushik,Dr Monika Kashyap, Ms Elizabeth Chaudhary, Dr Ravendra Singh, Mr Bhupendra Negi and Mr Soumya Paul for their effort to bring out this report.

(Sushil Kumar)



Acknowledgement

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We express our deep appreciation for the immense help throughout the execution of the assignment and valuable suggestions received from Shri Sushil Kumar and Dr Manoj Kumar Pant on sections of the report. Their regular guidance and feedback was invaluable for the project team in completing this exercise, which would not have been possible otherwise.

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Last but not least, I deeply express my thanks to Sri Alok Jain, IAS (Retd) Chairman Vitt Vetan Samiti, Government of Uttarakhand who has provide his valuable suggestions and guidance to make the document more applicable.

Deepak Bhandari
Managing Director
EHI International Pvt. Ltd.

Contributors

Shri Deepak Bhandari,
Managing Director, EHI International

Prof. Baharul Islam - *Team Leader,*
Dean, IIM Kashipur

Dr Mahendra B Kuruva – Senior Advisor
Asst. Professor, H.N.B. Garhwal University,

Dr. Namit Chaudhary – Senior Advisor
Prof & HoD Tourism, Jamia University, Delhi

Dr Subir Sen – Senior Advisor
Asst Professor, IIT Roorkee

Prof. Atulan Guha – Senior Advisor
Professor, IIM Kashipur

Prof. Vaibhav Bharmoria – Senior Advisor
Professor, IIM Kashipur

Prof. Ram K Dhurkari- Senior Advisor
Professor, IIM, Sirmaur, HP

Mr Nitesh Kaushik, Senior Advisor
Consultant, CPPGG

Dr Ravendra Singh
Sr Adviser EHI International

Dr Monika Kashyap
Asst. Professor, H.N.B. Garhwal University,

Soumya Paul
Research Associate EHI International

Advisory and Technical Support from DES & CPPGG

Shri Alok Jain (IAS Retd.)
Chairman, Vitt Vetan Samiti

Shri Amit Singh Negi
Secretary Planning

Shri Sushil Kumar
Director, DES

Dr. Manoj Kumar Pant
ACEO, CPPGG

Dr Dinesh Chandra Badoni

Shri Amit Punetha

Shri Maneesh Rana
Dy Directors, DES

Shri Karunakar Singh

Shri Nitesh Kaushik

Shri Ranjan Vohra

Shri Ajay Purohit

Ms Jacob Sharon
Specalist,CPGG

Abbreviations

AHS	:	Annual Health Survey
AI	:	Artificial Intelligence
AIBP	:	Accelerated Irrigation Benefit Programme
AICTE	:	All India Council for Technical Education
AIDS	:	Acquired Immune Deficiency Syndrome
AIMA	:	All India Management Association
AISHE	:	All India Survey on Higher Education
AL	:	Agricultural Laborer
AMRUT	:	Atal Mission for Rejuvenation and Urban Transformation
AMUL	:	Anand Milk Union Limited
ANC	:	Antenatal Care
ANM	:	Auxiliary Nurse Midwifery
APEDA	:	Agricultural and Processed Food Products Export Development Authority
ASCAD	:	Assistance to State for Control of Animal Diseases
ASDP	:	Agriculture State Domestic Product
ASHA	:	Accredited Social Health Activist
ATMA	:	Agriculture Technology Management Agency
AWC	:	Anganwadi Center
AWW	:	Anganwadi Worker
AYUSH	:	Ayurveda, Yoga, Unani, Sidha and Homoeopathy
BRAP	:	Business Reform Action Plan
CAC	:	Corporate Affairs Commission
CADWM	:	Command Area Development and Water Management
CAG	:	Comptroller and Auditor General of India
CAGR	:	Compound Annual Growth Rate
CATF	:	Convergent Action Task Force
CBDP	:	Community-Based Disaster Preparedness
CCA	:	Consolidated Consent and Authorization
CDCA	:	Cloud and Data Centre for Analytics
CDKN	:	Climate and Development Knowledge Network
CESS	:	Civilian End Strength Study
CETP	:	Common effluent treatment plant
CGST	:	Central Goods and Service Tax
CGWA	:	Central Ground Water Authority
CGWB	:	Central Ground Water Board
CHC	:	Community Health Centre
CMRY	:	Chief Minister's Rozgar Yojana
CSC	:	Common Service Centres
CTE	:	Consent to Establish
CTO	:	Consent to Operate
CWMI	:	Composite Water Management Index
DBT	:	Department of Bio-Technology
DC	:	Data Centre
DDDM	:	Data Driven Decision Making
DEA	:	Data Envelopment Analysis
DFI	:	Doubling Farmers' Income
DG	:	Distributed Generation
DICs	:	District Industries Centre
DIPP	:	Department for Promotion of Industry and Internal Trade
DPIIT	:	Department for Promotion of Industry & Internal Trade
DPR	:	Detail Project Reports
DRI	:	Directorate of Revenue Intelligence
DRIP	:	Dam Rehabilitation & Implementation Project
DST	:	Department of Science and Technology
DWSM	:	District Water and Sanitation Mission
EoDB	:	Ease of Doing Business
E-NAM	:	e-National Agricultural Market
FAO	:	Food and Agriculture Organisation
FEE	:	Foreign Exchange Earnings
FICCI	:	Federation of Indian Chambers of Commerce & Industry
FMCG	:	Fast-Moving Consumer Goods
FTA	:	Foreign Tourist Arrivals
FY	:	Financial Year
GBPUA&T	:	G.B. Pant University Of Agriculture And Technology
GBI	:	Generation Based Incentives
GCA	:	Gross Cropped Area
GDP	:	Gross Domestic Product
GER	:	Gross Enrolment Ratio
GFCF	:	Gross Fixed Capital Formation
GIA	:	Gross Irrigated Area
GIS	:	Geographic Information Systems
GLOF	:	Glacial Lake Outburst Floods
GSDP	:	Gross State Domestic Product
GSI	:	Geological Survey of India
GST	:	Goods and Service Tax
HARC	:	Himalayan Action Research Centre
HERC	:	Higher Education Reform Commission
HIV	:	Human Immunodeficiency Virus
HSRC	:	Himalayan State Regional CouncilI
BEF	:	India Brand Equity Foundation
ICD	:	Inland Customs Depots
ICD	:	Inland container depots
ICDS	:	Integrated Child Development Services
ICIMOD	:	International Centre for Integrated Mountain Development
ICP	:	Integrated Check Post
ICT	:	Information and Communicaion Technology
IDPH	:	Integrated Development and Promotion of Handicraft
IFAD	:	International Fund for Agricultural Development
IFFCO	:	Indian Farmers Fertiliser Cooperative Ltd.

IFFDC	:	Indian Farm and Forestry Development Programme
IGST	:	Integrated Goods and Service Tax
IHCAP	:	Indian Himalayas Climate Adaptation Programme
IIF	:	Institute of International Finance
ILSP	:	Integrated Livelihood Support Project
IMR	:	Infant Mortality Rate
IOFS	:	Integrated Organic farming System
IPCC	:	Intergovernmental Panel on Climate Change
IRENA	:	International Renewable Energy Agency
IT	:	Information Technology
ITA	:	International Tourist Arrivals
IWRM	:	Integrated water Resources Management
JnNURM	:	Jawaharlal Nehru National Urban Renewal Mission
KM	:	Krishi Mitra
KRIBHCO	:	Krishak Bharti Fertiliser Cooperative Ltd.
KWA	:	Kerala Water Authority
LCS	:	Land Customs Station
LPAI	:	Land Port Authority of India
LUP	:	Land Use Planning
MJSA	:	Mukhya Mantri Jal Swavlambhan Abhiyan
MNC	:	Multi-National Company
MNRE	:	Ministry of New & Renewable Energy
MNREGA	:	Mahatma Gandhi National Rural Employment Gurantee Act
MMP	:	Mission Mode Projects
MoCA	:	Ministry of Civil Aviation
MoU	:	Memorandum of Understanding
MOOC	:	Massive Open Online Course
MRO	:	Maintenance, Repair and Operation
MSME/MSE	:	Micro Small Medium Enterprise
MUDRA	:	Micro Units Development and Refinance Agency Bank
MVDA	:	Mountain valley Development Association
MVS	:	Multi-Village Scheme
NAARM	:	National Academy of Agricultural Research Management
NABARD	:	National Bank for Agriculture and Rural Development
NAPCC	:	National Action Plan on Climate Change
NBA	:	Nirmal Bharat Abiyan
NBSS	:	National Bureau of Soil Survey
NCDC	:	National Cooperative Development Corporation
NDP	:	Net Domestic Product
NEDWO	:	National Rural Drinking Water Programme
NeGP	:	National e-Governance Plan
NFDB	:	National Fisheries Development Board
NFHS	:	National Family Health Survey
NFSM	:	National Food Security Mission
NHM	:	National Health Mission
NIC	:	National Information Centre
NMAET	:	National Mission on Agriculture Extension & Technology
NMSA	:	National Mission for Sustainable Agriculture
NPOF	:	National Project on Organic Farming
NRW	:	Non-Revenue Water
NSDP	:	Net State Domestic Product
NSSO	:	National Sample Survey Office
NTFP	:	Non-Timber Forest Product
ODF	:	Open Defecation-Free
OTR	:	Own Tax Revenue
PACS	:	Primary Agricultural Credit Societies
PIP	:	Performance Improvement Plan
PKVY	:	Paramparagat Krishi Vikash Yojana
PMEGP	:	Prime Minister Employment Guarantee Programme
PMFBY	:	Pradhan Mantri Fasal Bima Yojana
PM-KISAN	:	Pradhan Mantri Kisan Samman Nidhi
PMKSY	:	Pradhan Mantri Krishin Sinchayee Yojana
PNC	:	Post Natal Care
PRASAD	:	Pilgrimage Rejuvenation and Spiritual Augmentation Drive
PSA	:	Priority Sector Advances
PV	:	Photovoltaic
PWD	:	Public Works Department
QIP	:	Quality Improvement Plans
RAFTAAR	:	Remunerative Approaches for Agriculture and Allied Sectors Rejuvenation
RAD	:	Rainfed Area Development
RASS	:	Remote Air Service Subsidy
RBI	:	Reserve Bank of India
RCS	:	Regional Connectivity Scheme
RES	:	Renewable Energy Sources
RKVY	:	Rashtriya Krishi Vikas Yojana
RRB	:	Regional Rural Bank
RWSS	:	Rural Water Supply, Sanitation
SAME	:	Sub Mission on Agricultural Extension
SBCC	:	Social Behavioural Change Communication
SBCCTF	:	Social Behavioural Change Communication Task Force
SBM	:	Swachh Bharat Mission
SCCC	:	State Climate Change Centre
SDC	:	State Data Centre
SDG	:	Sustainable Development Goal
SDRA	:	State Disaster Relief Authority
SGDP	:	State Gross Domestic Product
SGST	:	State Goods and Service Tax
SHC	:	Sub Health Centre
SHG	:	Self Help Group
SHPRTF	:	State Health Policy Review Task Force
SMAM	:	Sub Mission on Agricultural Mechanization
SMDPTF	:	Tasks Force to Review the State Disaster Preparedness for Medical Disasters

SME	:	Small and Medium Enterprises
SMSP	:	Sub Mission for Seed Planting Material
SOP	:	Standard Operating Procedure
SPV	:	Solar Photovoltaic
SQITF	:	State Quality Improvement Task Force
SSDTF	:	State Health Sector Skill Development Task Force
SSNAP	:	Stocktaking for Sub-National Adaptation Planning
STIP	:	State Technology Improvement Plan
STSG	:	Standard Treatment And Safety Guidelines
STITF	:	Technology Integration Plan In The State Health System
SWAN	:	State Wide Data Network
SWAYAM	:	Study Webs of Active-Learning for Young Aspiring Minds
SWCS	:	Single Window Clearance System
SWOT	:	Strengths, Weaknesses, Opportunities And Threats
SWSM	:	State Water and Sanitation Mission
SVS	:	Single Village scheme
TA	:	Teaching Assistants
TFPI	:	Total Factor Productivity Index
TFR	:	Total Fertility Rate
TPS	:	Transaction Processing Systems
TS-iPASS	:	Telangana State Industrial Project Approval and Self-Certification System
TTR	:	Total Tax Revenue
TUF	:	Technology Upgradation Fund Scheme
TW	:	Total Worker
UAPCC	:	Uttarakhand Action Plan on Climate Change
UBI	:	Unique Business Identifier
UCADA	:	Uttarakhand Civil Aviation Development Authority
UCOST	:	Uttarakhand State Council for Science & Technology
UDAN	:	Ude Desh ka Aam Naagrik
UEPPCB	:	Uttarakhand Environment Protection & Pollution Control Board
UFD	:	Uttarakhand Fisheries Department
UHHDC	:	Uttarakhand Handloom and Handicraft Development Council
UJN	:	Uttarakhand Peyjal Nigam
UJS	:	Uttarakhand Jal Sansthan
UJVNL	:	Uttarakhand Jal Vidyut Nigam Ltd
UKSERC	:	Uttarakhand Science Education & Research Centre
UNDP	:	United Nations Development Programme
UNWTO	:	United Nations World Tourism Organization
UOCB	:	Uttarakhand Organic Commodity Board
UPJN	:	Uttarakhand Peyjal Sansadhan Vikas evam Nirmaan Nigam
URWSSP	:	Uttarakhand Rural Water Supply & Sanitation Project
USRLM	:	Uttarakhand State Rural Livelihood Mission
UWMRA	:	Uttarakhand Water Management and Regulation Act
UWSSC	:	User Water & Sanitation Committee
U5MR	:	Under 5 Mortality Rate
VAT	:	Value Added Tax
VCSG	:	DescriptionVeer Chandra Singh Garhwali
VGF	:	Viability Gap Funding
VKC	:	Village Knowledge Centre
VPKAS	:	Vivekananda Parvatiya Krishi Anusandhan Sansthan
WDR	:	World Development Report
WSS	:	Water Supply and Sanitation
WIFS	:	Weekly Iron and Folic Acid Supplementation
WTTC	:	World Travel and Tourism Council
WUA	:	Water User Board
WWF	:	World Wide Fund for Nature

UTTARAKHAND ECONOMIC SURVEY 2019-20
Executive Summary

1. MACRO-ECONOMIC AGGREGATES:

1.1 GSDP and Sectoral Composition:

State GDP for 2018-19 at current prices is ₹ 2,45,895 crore clocking a growth rate of 10.35% over 2017-18. State's GDP at constant prices of 2011-12 for 2018-19 is ₹ 1,93,273 crore reflecting a GSDP growth rate of 6.87% over 2017-18.

1.2 Per Capita Income:

Per capita NSDP at current prices i.e. per capita income of the State is estimated as ₹ 1,98,738 for the year 2018-19 recording a growth rate of 9% over the previous year.

1.3 Sectoral Composition of GSDP in Uttarakhand

In FY 2018-19 Secondary Sector, contributed 48.93% of the State GDP (growth rate of 6.94%); the Tertiary Sector contributed 40.5% of GDP in FY 2018-19 (growth rate of 12.48%); the Primary Sector's contribution is 10.56% (growth rate of 6.92%).

2. PUBLIC FINANCE:

2.1 Fiscal Indicators:

Fiscal deficit rose to 3.78% of GSDP in 2018-19 from 3.45% in 2017-18. Policies aimed at improving tax collections and measures to cut down the revenue expenditure by bringing in operational efficiencies in functioning of the State Departments, are necessary. Improvem--ent in the quality of fiscal deficit called for.

2.2 Goods and Services Tax:

During the financial year 2019-20, up to December 2019, the State's tax collection of ₹ 11,755.67 Cr (CGST+IGST+SGST+CESS) was 3.6% lesser than the tax collected for the same period in the financial year 2018-19.

2.3 Non-GST Revenue:

The State excise as a percentage of own tax revenue declined to 14.21% in 2018-19, from 22.25% in 2017-18, which needs immediate attention and redressal. Stamps and Registration Fees as a percentage of OTR fell sharply to 5.02% of the OTR in 2018-19, from 8.68 % in 2017-18, which is in fact the lowest since the inception of the State.

In this context, the State could envisage initiatives like setting up of independent evaluation boards for land property, and one-time settlement scheme for settling pending under-valuation, in order to garner more revenue from this source (RBI, September 2019)

2.4 Tax Sharing with Centre:

The State received a revenue deficit grant of Rs. 5,076 Cr. It also received Rs. 574 Cr grants to rural local bodies, which constitutes 0.95% share in the total grants made to the rural local bodies. Uttarakhand received Rs. 278 Cr as grants to urban local bodies, which is also equal to 0.95% of the total grants made to the urban local bodies.

Against this backdrop, it is important to ensure tax buoyancy - the responsiveness of tax revenue to nominal GDP changes is made robust. It is in fact a key, not only for own tax revenues of the State but also for the tax devolution from the Centre.

More particularly, there is a need to have a clear operational distinction between short-run tax buoyancy, which helps to explain the role of government in stabilising the economy over the business/growth cycle, and long-run tax buoyancy, which is the capacity of the State to ensure fiscal sustainability in the long-run (RBI, 2019).

3. EXPORTS:

The State as the 19th largest exporting State of India in 2017-18, occupies a share of 0.48% in India's overall exports. During the period 2013-14 to 2017-18, exports from Uttarakhand registered a positive Compound Annual Growth Rate (CAGR) of 6.79% to reach USD 1.46 billion against a negative growth of -0.89% in India's overall exports.

Uttarakhand's 2 functional Inland Customs Depots (ICD) at Kashipur and Pantnagar to facilitate movement of EXIM cargo from hinterland witness very less cargo movement due to infrastructural and connectivity issues, compelling exporters to send their cargo by road to other dry ports or directly to ports.

In 2017-18, a gap of US$ 320.82 million was recorded between the total exports recorded by the State vis-a-vis exports through the above listed ICDs.

4. INFRASTRUCTURES:

4.1 Renewable Energy

4.1.1 Solar Power:

Uttarakhand tops the list of hill States in terms of supply of solar power at 254.56 MW, while Himachal lags behind at 16.37 MW. North-eastern States also lag behind on this front.

State Energy Policy (Revised) – 2018 resulted in a total of 202 MW of combined capacity projects being allocated to 283 developers till date. In addition to this, as a part of promotion of solar energy, 12,000 solar lights have been installed in remote locations of the State, with the support of MNRE, Government of India.

4.1.2 Hydro Power:

The total capacity of hydropower projects in the State is 24551 MW, out of which 3957 MW is under construction, while for 2357 MW, DPR has been approved.

A MoU between UJVN Limited and the Centre for Alternative Water Energy, Indian Institute of Technology, Roorkee for research and development of surface electric turbines, in which surface turbines would be installed in canals, holds promise and requires to be supported.

4.1.3 Bio Energy:

Two biomass briquette based power plants of combined capacity of 1060 kilowatts have been allocated to private developers under the Pine Needle and Other Biomass Based Energy Generation Policy-2018 in the State. The State has implemented Pine needle and other biomass based energy production policy. Under this policy, 21 projects have been allocated so far. It is envisaged to set up six thousand Pirul plants in the State. This initiative is expected to provide direct and indirect employment to about sixty thousand people.

Challenges and the Way Forward:

- Higher costs, Access to credit,
- Lack of availability of skill sets,
- Lack of strong institutional mechanisms,
- Inadequate infrastructure and investments,
- Uncertainty caused by sector specific issues and policy change due to judicial interventions.

Strong policy directions are called for, supported by strong institutional mechanisms for project implementation in mission mode. Continuous monitoring of progress at highest level necessary so that roadblocks are overcome in a timely manner, as they are encountered.

Need to focus on strengthening the research and development capabilities in the State that could further foster advancements in technology through innovations in this arena.

4.2 Civil Aviation:

Uttarakhand being the biggest beneficiary of second round of UDAN, it is imperative to explore the possibilities to widen its coverage. The State has its set of challenges to be overcome, where the issues like subsidies, skills, and financial viability require to be addressed successfully. Models of subsidies can be emulated from States like Madhya Pradesh and Manipur. With respect to the policies related to community participation in connecting connecting remote areas, inspiration could be drawn from Australia's Remote Air Service Subsidy (RASS) model.

On the other hand Telangana shows the way for pro-active policy initiatives on the front of addressing skill gaps.

In addition to this, the State has a unique potential for Heli services to be transformational in terms of tourism and medical evacuations.

Nepal offers policy insights into pressing Heli services for tourist needs as well as medical evacuations. Uttarakhand could give policy directions to create an eco-system that would contribute to the growth of this segment of civil aviation. Hosting Maintenance, Repair and Overhaul (MRO) hub in the State is a viable opportunity to be tapped under special thrust given to this activity by the Central government.

5. EDUCATION:

The Gross Enrolment Ratio (GER) of Uttarakhand in Higher Education (18-23 years) stands at an overall 39.1% which is higher than the national figure of 26.3%.

In the area of Technical Education, the most striking fact that emerges is the low capacity utilization in undergraduate and postgraduate level institutions in the State. Out of the total intake capacity of 38,318 seats, only 17,769 students were enrolled during 2018-19. Out of these enrolled students, only 8,011 found job placements at the time of graduation.

Therefore, the technical institutions in the State have to rethink their strategies and proactively redefine their teaching-learning and quality scenarios with a view to incorporate 'employability' aspects within the subjects and curriculums they offer. Such a strategic reform can be facilitated by the Government and should invariably involve other stakeholders like industry, local entrepreneurs and SMEs.

A new strategic action plan is necessary to respond to the 'changing nature of works' (2019) that will address the capacity-gap of the institutions with respect to students as well faculty, to move the State towards a global standard in competitive education that will churn out 'employable' graduates.

There is a need for the State to reorient its education and training sectors – especially the higher education and technical education. Uttarakhand should, therefore, rethink how its youths are educated, trained and developed today so that they fit into the workspaces of the future. The policy directions in this regard must be comprehensive, encompassing the complete life cycle of an individual and, in the larger scenario, the entire populations in the State. Any policy intervention in this direction needs to acknowledge three major paradigm shifts that are happening at present in technology and globalisation, education and training ecosystems, and repositioning gender as a paid workforce.

GOAL 1	Redefine a responsive higher/technical education & training system that meets the needs of future workplaces & raises the aspirations of all learners
GOAL 2	Advance the progress of learners who are at a disadvantage and learners with special educational needs to support them to achieve their potential
GOAL 3	Equip our educational institutions with the educational planning skills and support to provide a quality learning experience in a new range of courses.
GOAL 4	Intensify the relationships between education and the wider community, society, industry and the economy at the local and national levels
GOAL 5	Steer the delivery of strategic direction and supportive systems in partnership with key stake holders in education and training to help each institution to assess its capacities and set its own targets.

Suggested Higher and Technical Education Action Agenda for the State

1. Form a State Higher Education Reform Commission / Task Force (HERC)
2. Draft a consent framework for deploy -ment by higher / technical education institutions
3. Support institutions on the impleme- -ntation of the reform strategy
4. Publish a report on the proposed reforms and new directions in higher / technical education institutions
5. Develop a monitoring and evaluation framework to generate data on resource allocation, to ensure that strategic plans/inputs are linked to outputs and outcomes and to share knowledge and successful initiatives to support better practice across the institutions
6. Develop guidelines for universities / Institutions to support successful transitions in various stages of the education spectrum to facilitate an integrated model of access from UG to PG and Doctoral levels
7. Commence the roll-out in universities /institutions of an action plan in the implementation of job market-based contents within existing programmes, to help reduce the gap in 'Degree' achievement and 'employability'.
8. Implementation of an education system redesigning Model to deliver the right supports at the right time to the faculty, administrators and students with additional capacity building and training.
9. Manage interventions in poorly performing institutions through deve- loping a guide to good practice on 'self-motivated' curricular evaluations.
10. Consult with relevant stakeholders - Industry / SMEs on the detail of curriculum contents required for the redesigning of Higher and Technical education education-training systems in the State.
11. Support a state-wide "Skills for Growth" campaign in partnership with univer- -sities and institutions to make it easier for them to identify their future skill needs with a view to ensure that the higher and further education systems meet the skills needs of students, the economy and society.
12. Conduct a review of the entire *"Redefining Higher & Technical Education in Uttarakhand"* mission. It will include a cost benefit analysis of 'professionalisation' of the existing systems, contents and processes, in consultation with relevant stakeholders, and to include an assessment of how best to improve the impact on the State's economy from the education sector.
13. Assess the degree of balance in the higher and technical education system in Uttarakhand, consider how that impacts on skills needs and future capability, prepare a report setting out a roadmap of measures where appropriate to develop and maintain an optimal ecosystem.
14. Review and update the Overall Strategic Framework for Higher Education in the State. Introduce a new frame work for an integrated strategic approach to tertiary education.
15. Lead industrial relations negotiations on behalf of the Education Department and the higher education and training sector and provide industrial relations and employment law advise to the Unive- -rsities /Institutions in the State.

6. HEALTH & WELLNESS:

Uttarakhand's broad health indicators like, birth, death, infant mortality rates and maternal mortality ratio have improved remarkably while micro-indicators such as access to primary and secondary medical care, antenatal care, immunization coverage, anaemia and malnutrition, continue to lag behind. The State has witnessed a surge in some communicable (Tuberculosis) and non-communicable diseases (diabetes, HIV/ AIDS hypertension), attributable to life style changes.

In order to achieve the Sustainable Development Goals and targets envisaged in the Uttarakhand State Vision 2030, it is necessary to strengthen the policy and implementation framework and institutions with the following goals, to launch and sustain a multi-pronged mission with strong oversight and accountability strucutures.

GOAL 1	Revisit State Health and Family Welfare Policy 2002 and revamp it to become responsive to current and emerging needs of the population and supportive of the SDG goals set for 2030.
GOAL 2	Develop a ten year social behavioural change communication strategy and steer a paradigm change in approach to public health by making behavioural change as its core strategy to improve health seeking practices & well being
GOAL 3	Undertake comprehensive approach to make quality of medical care a core value amongst all State health personnel; equip and train them to achieve this objective.
GOAL 4	Make fullest use of technology so that good quality medical services become easily accessible to entire population. Rapidly upscale tele-health services across the State
GOAL 5	Reskill and multi-skill health personnel,to overcome shortage of medical personnel, to cater to the current and emerging health care needs of the people. Strengthen supportive supervision of health personnel making optimal use of technology to bring more accountability to agreed deliverables
GOAL 6	Integrate AYUSH and Health Department's plans and activities to promote good health and well being of its people through joint actions aimed at improving health preservation and positive behaviour to prevent illness. Provided necessary thrust to AYUSH Policy 2018 to realise its potential to become a growth driver of the State on social and economic fronts.
GOAL 7	Urgently strengthen health infrastructure capacity and capability of personnel to effectively respond and manage medical emergencies, disasters, accidents and pandemics such as COVID-19,put in place SOPs and train its health personnel in seamless adoption of the same.

Suggested Health Action Agenda for the State

1. Form a State Health Policy Review Task Force (SHPRTF)
2. Prepare District and State Health Action Perspective Plans 2024
3. Prepare State Implementation Plan 2021- 22
4. Form a Task Force to craft a comprehensive behavioral change communication strategy 2020-2030(SBCCTF)
5. Prepare a State behavioral change communication strategy 2020-30
6. Constitute a State Quality Improvement Task Force (SQITF)
7. Identify and train Quality Champions in District Level Hospitals, CHCs and BPHCs.
8. Develop Infrastructure Upgradation and Quality Improvement Plans (QIPs) Plan for District Hospitals, CHCs and BPHCs.
9. Form a State Health Sector Skill Developm-ent Task Force (SSDTF) to identify skill gaps and develops skills development modules for re-skilling and multi skilling of health personnel in District level hospitals and CHCs
10. Training of trainers in each medical college and district level hospital to conduct skills development courses
11. Set up Convergent Action Task Force (CATF) consisting of AYUSH & Health Dept. Officials to develop and steer a convergent action plan
12. Form State Medical Disaster Preparedness Task Force (SMDPTF) to prepare and steer implementation of the State Plan 2024

7.WATER RESOURCES AND SECURITY:

Despite the rich water resources, the State is confronted with many challenges on the front of water security. They range from over extraction of ground water to lack of a ground water policy, and from data issues to recession of glaciers. Even the latest Composite Water Management Index (CWMI, 2018) by NITI Aayog, has ranked Uttarakhand as one of the lowest in performance index of water management. In this context, the State may envisage measures like (a) Integrated Water Resources Management (IWRM) water security management based planning, (b) tightening of the ground water legislation, (c) better management of the precipitation within the State, (d) incorporating traditional and indigenous knowledge, (e) promoting community awareness and action, (f) strengthening of institutions,(g) reversing glacial recession, (h) enhancing data collection capacity and capability, (i) using the water lens for development of policies and incentives related to agriculture, (j) development of block level and urban area water management committees and (k) incentivizing mechanisms for water conservation at individual and community level. These efforts on the policy front would go a long way in promoting water security of the State. To improve the water scenario of the State the following areas require policy and implem -entation strengthening:

- **Integrated Water Resources Management (IWRM):** Rivers require a lot of focus to make more and more runoff available for use within Uttarakhand and it is suggested that waterman-agement across the State shifts to Integrated Water Resources Management (IWRM).
- **Water Security Management Based Planning:** There is an urgent and critical shift required from water availability based planni-ng and implementation to water security mana-gement based planning and implementation.
- **Ground Water Legislation** to be tightened and made more focused on demand side management in a proactive manner. Use of technology advancements for good water man-agement may be intensified.
- **Increased Decentralization** is an imperative. The diversity of challenges and the adversity of terrain calls for increasing the swiftness of action and localization of solutions.
- **Partnerships and Stakeholder Coordination:** One of the most important requirements now and in the long term as well, is improving the coordination between various sources, sectors, stakeholders, and departments. This will make the whole system more efficient and effective towards realising the outcomes.
- **Managing Precipitation Within the State:** There is an immediate need for consistent focus on better management of precipitation in the State. Use a combination or integration of modern and indigenous knowledge for the same.
- **Incorporating Traditional and Indigenous Knowledge**: Use traditional and indigenous knowledge, and accord necessary attention and resources to stop and reverse their neglect and integrate them with modern sources of water for planning and implementation purposes.
- **Community Awareness and Action:** Increase community awareness and action to enable better demand management and increase participation of communities in resou-rce management.
- **Strengthening of Institutions:** increased decentralization, partnerships, use of indigeno-us knowledge and community action all warr-ant for stronger and more mature institutions.
- **Reversing Glacial Recession:** There is critical need to better understand glaciers and glacial melt. Action-research plans need get a quick start to develop implementable strategies and actions for reversing glacial recession.
- **Scientific Need Assessment of Water Requirement:** Based on data based population projections for drinking water, irrigation, entertainment and most importantly

industrial demand, a sound assessment of water requirement, needs to be conducted.

- **Enhancing Data Collection Capacity and Capability**: Inadequate data on rainfall and temperature number of meteorological stations to be increased or collect reliable data from private sources such as Skymet weather and other such sources.

- **Using the water lens for development of policies and incentives related to agriculture.**

- **The State should develop an agricultural water export index to better drive its water balance.**

- **Development of block level and urban area water management committees** and bespoke strategies for water conservation, based on topography and climatic conditions.

- **Incentivizing mechanisms for water conservation** at individual and community level.

- **Large scale citizen knowledge empowerm--ent & engagement programmes**. Creation of open access database.

- **Revival of Traditional Water Sources**: Special task forces to be formed to prepare action plans on revival of traditional water sources such as springs, as well as their integration into water management plans for local areas as well as regions.

8. GROWTH DRIVERS - PRIMARY SECTOR:

The diverse agro-climatic conditions and the varied soil characteristics makes the State suitable for cultivation of a variety of high-value seasonal and off-season crops along with fruits, vegetables, flowers and other cash-crops. This major strength of the State needs to be exploited. Horticulture crops are more suited to hill climate and topography.

Despite the efforts of Directorate of Agriculture and the Horticulture Department, the situation at the farm level is below expectations. Most of the policies, especially those under 100% sponsorship by the Central government are being implemented, but the policies per se do not often benefit the target population. The policies are too top-down in nature and the requirements of the beneficiaries are not accounted for in the design and execution of the schemes. Few reasons behind slow subscription and/or participation of farmers in these programmes are lack of awareness, lack of experience and hesitation to innovate. In addition, the confusing and at times complicated procedures, along with uncertainties with regard to actual release (or receipt) of funds, makes the programmes

discouraging. *It is widely accepted in policy studies and research, that every policy needs to be assessed in terms of its impact not only on raising productivity, income and livelihood opportunities but also in terms of the beneficiaries' experiences, which may motivate future participation in government sponsored projects and programmes*.

In addition to this, good agricultural policies need to be either incorporated or redesigned to suit local conditions. It is time that the State government analyses critically the reasons behind success of farm policies and schemes outside the State (such as in Uttar Pradesh, Himachal Pradesh and the North Eastern States) and explore the problems that led to failure of certain programmes within the State.

The increase in low productive marginal and small farm holdings in the State is a matter of great concern. Land for agricultural purposes in the State has remained constant and reportedly vertical utilisation of land is very slow paced. Rapid urbanisation has led to rapid conversion of agricultural land. The pressure on land is further exacerbated by the increasing fragmentation, declining holding size and migration of men from villages. The solution towards enhancing economies of scale from the increasing number of marginal and small land holdings could be emphasis on alternatives institutional arrangements such as forming marginal and small farmers' co-operative, contract farming, and interventions through groups formed through micro-finance and micro-credit initiatives, involving women self-help groups and promotion of local level consortium.

The Cooperatives in the State *are playing a significant role*. The State cooperatives aim to create opportunities for self-employment for its members. Such initiatives are important as such may reduce out-migration and stop the ill-fated transformation of villages into "ghost villages". *The Department is also helping in promoting tourism and supporting village and community level cooperatives. Potential for the cooperatives exists in the State to grow, in terms of both outreach and expanding the basket of activities.*

All the cooperatives in the state work together and is an ambitious plan. The efforts with regard to cooperatives may provide a low-cost solution based self-employment opportunities, again urgently required in the state for restricting out-migration. *In this model, it is proposed that different departments, which could bring harmony to the primary sector, may be integrated for better action-oriented policies of the State for welfare of its people*.

The government should promote these institutions and provide better rules and regulations that can increase the flexibility of the registered societies, guide formation of new societies and engage in thorough assessment and impact evaluation of the programmes towards income increase, livelihood diversification and overall rural development.

To ensure fulfilment of the objectives as in **Doubling Farmers' Income** (DFI), improvements in markets for agricultural products, assurance for better prices, easy access to credit and farm income insurance, protection against extreme events, technology adoption in weather information processing and dissemination to reduce production losses are key steps.

The SEVEN sources identified by the Ashok Dalwai Committee are i) improvement in crop productivity; ii) improvement in livestock productivity;iii) resource use efficiency or saving in cost of production; iv) increase in cropping intensity; v) diversification towards high value crops; vi) Improvement in real prices received by farmers; and vii) Shift from farm to non-farm occupations.

Document and understand thetraditional knowledge of the farming communities before enforcing a strategy. For ensuring sustainable practices, the adaptation practices need to be localised and the benefits should reach the smallest farmer in the community.

Constant state of disaster preparedness at every level has to be integrated with development. Technology-based approaches like early warning systems should be supplemented by community-based disaster preparedness (CBDP).

Hill agriculture can become growth driver if and only if policy making acknowledges the climate threats, includes community perception in framing adaptation policies and encourages participation of all through structured dissemination of scientific knowledge to those who may be currently ignorant of available modern technologies.

9. GROWTH DRIVERS - TOURISM:

Based on the analysis of strengths, weaknesses, opportunities and threats of the Uttarakhand tourism industry, the following is the proposed way forward:

Vision

There should be sustained strategic efforts to offer tourism products developed around the organic personality of the State of Uttarakhand. Pristine, unspoilt nature is the core resource. Uttarakhand should focus on **transformational tourism** safest for visitors, where key products would include- Spiritual (religious) tourism, Nature-based (eco-tourism, herbal tourism, wildlife photog -raphy) tourism, Adventure (mountain-based, and river-based) tourism, Wellness (Yoga, Ayurveda) tourism and Rural (including gastronomic tourism, handicrafts) tourism.

- A specialised product focused on health and well-being in the form of transfor--mational tourism may be offered.
- This transformational tourism tag will

offset the challenge of the seasonality of *Char-Dham*Yatra when it is not being organised

- Transformational tourism products will act as supplementary products during the yatra time, and thus, the same will ease up the crowd management
- Transformational Tourism, which has been acting as a supplementary product during the yatra time will become the core product of Uttarakhand when yatra is not taking place.

Strategic Interventions

1. Focus on tourism yield rather than tourist traffic alone.
2. Create a separate cadre of *Tourist Police,* which can multitask for first-aid, tourist information, roadside assistance, traffic controller etc.
3. For Ghost-villages have a Second Home Policy and a Policy for Scatter Hotels.
4. Have a traffic policy n place or tourist , differential paking and tolls to encourage. visitors to leave busy locations for outskirts.
5. Provide for capacity building, especially for homestays, adventure sports, culinary trades, wellness instructors, disaster management, etc.- under the MoT, GoI's capacity building schemes.
6. Promote rural tourism entrepreneurship and provide for incubation and hand-holding.
7. Policy for low impact tourism and hospitality infrastructure, including sustainable vernacular architecture.
8. Distinct promotional campaigns for domestic segments and inbound segments Extensive use of social media for promotion.
9. There should be continuous research and customer feedback monitoring

Tactical Moves

1. People involved in tourism related activities, including transportation should be trained in hygiene, cleanliness, waste management and prevention of infection to offer tourism experience free of worries from infections like COVID-19.
2. Better inter-departmental coordination. An empowered and strengthened UKTDBmay serve as a facilitator for coordination among various departments like forests department, rural development, urban development, culture, AYUSH, Police, PWD, Gram Panchayats, etc.
3. Identify and develop micro destinations for slow tourism. Such destinations should focus on weekend urban market and should be well connected to them,
4. An annual calendar of fairs, festivals and cultural festivals in the State should be created well in advance. There should be fixed dates for major events. Information should be made available to the public and intermediaries well in advance.
5. All departments concerned with the creation of tourism infrastructure or its maintenance should have an earmarked budget allocated for tourism-related activities like maintenance of the roads, hygiene and sanitation, electricity, CCTV and these departments may jointly set priorities and monitor progress with the Tourism Dept.
6. Marketing should use highly creative methods and content. Each tourism product/destination varies in nature and 3 targets a different audience. This requires a multi-modal approach. Effective use of social media should be made through a dedicated team for marketing tourism products and destinations.
7. Measures should be taken to deal with seasonality and the creation of theme-based circuits.
8. Effective steps should be taken for the regulation of traffic, especially in pilgrimage sites and ecologically fragile zones. Management of Char Dham Yatra merits immediate attention.
9. Development of world-class services like 5-star hotels and convention centers in cities are needed.

10. Village development plans with a tourism component should be discussed at the Gram Panchayat level. More the ownership of the host communities, dispersal of tourism benefits will set off a positive cycle.

11. More training and skill development programmes should be organised for community-based tourism.

10. GROWTH DRIVERS - Micro Small Medium Enterprises (MSMESs):

MSME sector has emerged as the second largest employment generation sector of Uttarakhand. At present there are 53,000 MSME units, with a capital investment of Rs. 10,960 crore, and generating employment to 2,58,000 people. The State envisages to establish 1,70,000 MSME units, with a capital investment of Rs. 36,000 crore, that could generate employment to 8,50,000 people by 2030.

The larger State specific challenge is the regional disparity among the hill and plain districts of the Uttarakhand, in terms of number of MSME units, investments and employment.

Bringing in more flexibility in the labour regulations, rejuvenating the State's Start-up Policy, enhancing financial literacy, and technological up gradation of MSMEs in the State and investment in key promotional infrastructure like rail and road connectivity, logistics hub, CETPs Policy interventions on this front could potentially take the the MSME sector in the State to new heights in the time to come.

Adopting cluster approach, especially in hill districts with focus on district specific clusters of MSMEs most suited to respective districts and based upon the their strengths and available resources as well as potential.

Developing plug and play infrastructure for start-ups.

Assigning a stewardship role to revamped District Industries Centres to facilitate and hand hold MSMEs to take root till a strong eco systems is developed to take on the mantle.

11. EASE OF DOING BUSINESS (EoDB):

Uttarakhand is making new strides on the front of Ease of Doing Business by improving its performance on various assessment parameters. Currently, it tops the list of EoDB among all the hill States in the country. For 2018-19 the State will be assessed only on the basis of feedback received from the users/industries on 80 reform points. The fact that there is a large gap between the scores of feedback and reform implementation, suggests that there have been fault lines underneath its success and highlight the need to bring in reforms in the existing Single Window System. While the State is documenting whatever it does very well, it is equally important to do whatever it documents. The series of windows behind the single window need to be reduced and handholding support provided to investors to navigate through the multiple hoops of procedures and documents.

12. DATA FOR DECISION MAKING:

The IT sector in the State has consolidated its strengths by digitizing many of the public services, especially by provisioning these services through the Common Service Centres (CSCs), e-District, State Wide Data Network (SWAN), State Data Centre etc. However, there are three major lacunae in the current eco-systems of information systems used by various government departments.

Firstly, the data and information collected through various systems is not integrated.

Second, the data and information is idle and not being analysed to increase the effectiv--eness of government departments, their services, policy design and monitoring.

13. ENTERPRENURESHIP DEVELOPMENT:

Entrepreneurial footprint in the growth story of Uttarakhand is limited. In addition to State Government's efforts, sustainable entrepreneurship development in Uttarakhand requires a transformational approach, as mere incremental steps may not be able to provide the required growth. The focus must shift from creating 'manufacturing' enterprises to 'knowledge centric' enterprises. This requires investments in multi-layered value chain of products and services, based on the natural strengths of the State.

A shift from production centric / manufac--turing centric economic outlook to knowledge centric economic outlook for the State, leveraging the natural strengths of the State by making a value Chain / Supply Chain analysis to connect cottage industry, micro enterprises MSMEs - large industries in an integrated chain; re-examining the entrepreneurship development programmes and upgrading them in terms of content and training methodology, developing & maintaining a for public database; successful / innovative entrepreneurial initiatives across the State to inspire local aspirants, are some of the measures that could take the entrepreneurial culture in Uttarakhand to new heights.

14. POLICY OUTLOOK : POST COVID

As the Economic Survey goes to press, The COVID-19 pandemic plunged the global economy into an unprecedented health emergency. The Union and State governments have resorted to series of lockdowns bringing economic activity to a grinding halt, followed by cautious relaxations. The immediate priority at hand is to save lives and then the livelihoods. The State has been successful in containing the spread of COVID-19 and has saved lives, and is to a great extent effectively tackling the challenge of returning migrants.

The next immediate challenge at hand is to save the livelihoods.

Policies aimed at fighting the looming economic crisis need to discriminate between sectors that are facing slowdown and even extinction from those that are likely to bounce back or even boom in the wake of the pandemic. This targeted approach needs to be adopted while attempting to address the growth concerns.

On the one hand there is a need to increase the purchasing power of the people while taking into account the inter-sectoral linkages, and on the other hand is the need to support the MSMEs, micro and household enterprises, the supply chains, especially for the farm and food sector. Tourism sector is especially hard hit and unless supported, would take a long time to emerge from deep recession.

In the short term, the State may focus on the following:

Food Security – Provide free food to BPL families whose earning member(s) have lost their jobs, through PDS outlets, till they are re-employed;

Expand Range of Activities Eligible for MGNREGA Support – Allow work in private farms**,** orchards, animal husbandry, dairy, apiary, fishery, household and micro enterprise activities to be eligible for MGNREGA support. This will also provide revival of these rural activities and enterprises and at the same time help in reskilling people to become more employable even when MGNREGA support is exhausted.

Rope in Cooperative Societies – Bring-in the cooperative societieis and strengthen/expand their membership in the State to provide support to the jobless and hire them in gainful work related to farm produce, value addition and supply chain activities.

Prepare to Reopen Tourism with a Bang by Autumn 2020 – Concerted efforts on war footing are required to prepare the tourism sector and associated workforce in hotels, guest houses, homestays, transportation, shops, dhabas, public places, entertainment centres, amusement parks, raod side ameneties, to adapt to the reality of living with infectious diseases and establish strong hygiene and preventive health standards, adopt SOPs for cleanliness, health safety to make the State the safest to travel to. This statewide gearing up to become recognised as the "**safest tourism desitnation in India**", should to be accompanied by an all encompassing promotional, marketing campaign developed and launched to build up for autumn welcome of tourists to the State. *This is a good time to reboot tourism management in the State so that the State residents become integral in the tourism ecosystem.*

Strengthen broadband connectivity

throught the State on a war footing, to allow people to work from home and make use of available technology for a wide range of activities including education, healthcare, skills development, entertainment, commerce, marketing of agricultural produce and tourism services.

Strengthen State Capacity for Management of Infectious Diseases - Urgently strengthen health infrastructure capacity and capabilities of health personnel to effectively respond and manage medical emergencies, disasters, accidents and pandemics such as COVID-19 in a rapid and seamless manner, adopting prescribed SOPs under a strong unified command strcuture.

Push to Stalled Projects – Give a push to stalled projects, in mission mode with regular progress review at the very top to overcome hurdles and accelerate the implementation process.

Utilise 100% of Sanctioned Budgets of All Departments – Orient the departmental heads, assign them clear performance targets for the next 9 months to effectively speed up implementation of all sanctioned plans and utilize 100% sanctioned budgetary provisions. Conduct monthly reviews and take strong corrective action.

Set up robust mechanisms for fast tracking availament of benefits of Pradhan Mantri Garib Kayan (PMGK) Package and Atamnirbhar Bharat Abhiyaan (ABA) – Each government department should set up a specialised team to examine and assess the benefits of the special economic packages and develop capacities of PRIs, ULBs, district and block level officials, front line workers while partnering with NGOs, Cooperative Societies, Rural and Cooperative Banks to create awareness amongst communities to come forward to optimally avail the benefits offered to them and facilitate them in documentation and other activities till the benefits are received by the target people.

Medium Term Focus may be laid on the following:

Opening up livelihood opportunities in all 13 districts and possibly all blocks, through aggressive and time bound start to agri-produce based enterprises, cold storage clusters, supply chains, warehouses and marketing of the value added products, allowing tented/camping accommodation to come up in new tourist destinations and allowing tourists accommodation in PWD and forest rest houses with the help of skilled in migrants, several of whom are from the hospitality sector.

ICT Based School & Higher Education/ Skill Development Activities – Shift focus to bring in a strong element of ICT based education and state-of-the-art solutions for skills development in various sectors, giving priority to sectorslikely to experience increased demandsuch as public health, personal safety, fitness, wellness, ICT based solutions, streaming of live entertainment, production of films, music, gaming, ecommerce, logistics mgmnt., warehousing, home delivery etc.

Telehealth – Universalise tele-health to reach all residents to cater to 80% of their healthcare needs through front line health workers, health and wellness centres, state government dispensaries and mobile health vans.

- **Build up Capital Assets** for Tourism and Plug and Play Infrastructure Clusters for MSMEs, Pirul power generation units, roof top grid connected solar power units, in every district of the State. Take on low cost debt to build capital assets, use labour from MGNREGA for the purpose. This will also provide much needed employment opportunities to State residents without having to leave their homes.

In the long term, the State needs to focus on developing alternative strategies of creating competitive advantage in the manufacturing, knowledge and tourism sectors. Some of these challenges can be partially addressed with improvement in the supply of skilled workforce at competitive rates, development of local entrepreneurship, ensuring availability of cheap and abundant electricity based on more renewable energy.

Transformation of Uttarakhand into a knowledge economy, large scale training of Uttarakhand residents to emergency response, sectoral guidelines and SOPs for emergency response to build a resilient population; and governance reforms will surely help the State government in driving Uttarakhand towards a stronger economy riding on sustained and more remunerative livelihoods.

To make the workforce more skilled and ro develop the culture of entrepreneurship requires investment in human capital development. There should be professionally managed identification of skill gaps and adequate emphasis on the cultural aspects of entrepreneurship. This could help the State to trek the path of a sustainable growth trajectory and emerge from the paralysing blow dealt by the COVID-19 pandemic.

15. BRIDGING THE IMPLEMENTATION GAP

State's experience of previous two decades, demonstrates that in absence of strong implementation mechanisms and robust and responsive institutions, the good intentions and vision statements are unlikely to benefit the people to the extent envisaged.

It is necessary to bring together the execution capacities of the State, steer upgradation of capacities and management skills to manage the ambitious strategies and plans; empower them and make them accountable to outcomes with clear and measurable indicators of progress.

Set short, medium and long-term goals, thematic areas, road maps and strategies for the overall development of the State in keeping with the Vision 2030. Encourage and build institutional capacities in districts to take forward the agenda by localising State strategiesa and plans so that the actions and benfits percolate down to the last person.

Constitute Empowered Task Forces To Spearhead Each Thematic Area:

Each thematic area requires an empowered tasks force of highly motivated programme

planners, managers, technical experts, and other selected stakeholders depending on their envisaged role in steering the implementation process.

Stewardship - Monitoring, Timely Feedback and Course Corrections:

The designated empowered tasks forces need to provide timely and regular stewardship support to the programme managers so that hurdles in start-up phase are overcome without disturbing the programme time frame. The task forces need to promote convergent action amongst concerned departments to build programmatic synergies. Necessary and timely corrective action by the empowered tasks forces can save a programme from becoming a non-starter or straying off course.

CHAPTER 1
General Overview of the State's Economy

"When the Facts Change, I Change My Mind."

--- John Maynard Keynes

1. MACRO-ECONOMIC AGGREGATES:

1.1 GSDP and Sectoral Composition:

The State GDP for the year 2018-19 at current prices is ₹ 2, 45,895 crore (Size of the Economy) showing a growth rate of 10.35% over the previous year. The State's GDP (at constant prices of 2011-12) for 2018-19 is ₹1, 93,273 crore, showing a GSDP growth rate of 6.87% over the previous year. Per capita NSDP at current prices i.e. per capita income of the State is estimated as ₹1,98,738 for the year 2018-19 recording a growth rate of 9% over the previous year.

The sectoral composition of GSDP in Uttarakhand's economy is dominated by the Secondary Sector, which contributed 48.93 % of the State GDP, while at the national level the Tertiary Sector dominates the GDP. The Tertiary Sector in the State is growing at a relatively higher rate, resulting in increasing share of Tertiary Sector and marginal decline in share of Secondary Sector in the State economy. The State Tertiary Sector has contributed 40.5% of GDP in FY 2018-19. The Primary Sector's contribution to GSDP is 10.56%. Provisional estimates for 2018-19, at current prices, reveal that Tertiary Sector grew at the rate of 12.48% followed by the Secondary Sector at 6.94% while the Primary Sector lagged behind with growth rate at 6.92%.

1.2 Per Capita Income:

Per capita Income or the average income of population in an economy serves as an indicator of the average improvement in the living standards in that economy. Per Capita Income of Uttarakhand is higher than the national average. The average per capita real income of Uttarakhand (measured at average per capita NSDP at 2011-12 prices) shows a continuous increase. For the last 3 years, i.e., FYs 2016-17, 2017-18 and 2018-2019, the average per capita real income in Uttarakhand was ₹161,172, ₹182,320 and ₹198,738 respectively, while at the national level this was estimated as ₹104,659, ₹114,958 and ₹126,406 respectively for the same time periods.

2. PUBLIC FINANCE:

2.1 Fiscal Indicators:

On fiscal front, the fiscal deficit rose to 3.78% of GSDP in 2018-19 from 3.45% in 2017-18. Given the fiscal commitments of the State and a foreseeable economic slowdown, rise in the fiscal deficit is a major challenge that needs to be tackled with utmost caution and urgency. Policies aimed at improving tax collections and measures to cut down the revenue expenditure by bringing in operational efficiencies in functioning of the State Departments, would go a long way in bringing down the fiscal deficit. While reducing fiscal deficit is important for State's fiscal health, equally important is improvement in the quality of fiscal deficit. On the other hand it is pertinent to note that efforts to ensure a reduction in fiscal deficit, should not lead to a reduction in spending on key social and economic services.

2.2 Goods and Services Tax:

During the period between 01 July 2017 and December 2019, a total of 98,676 dealers were registered, whereas 69,898 registered dealers migrated from VAT into the new system. Thus up to 31st December 2019 total number of registered dealers in the State reached 1, 68,570.

During the financial year 2019-20, up to December 2019, the State's tax Department had collected a tax of Rs.11,755.67 Cr (CGST +IGST +SGST+CESS). However this was 3.6% lesser than the tax collected for the same period in the financial year 2018-19, in which year, tax collection (CGST+IGST+SGST+CESS) was Rs.12,196.87 Cr.

Uttarakhand being a mountainous State having tough terrains makes approaching people and creating awareness among small taxpayers of the State, an arduous task. For overcoming this problem a unique concept of GST Mitra has been devised and so far 1434 GST Mitras have been trained. In the general interest of dealers, an insurance scheme has been made applicable for a period of one year beginning from 19.11.2019 to 18.11.2020. The scheme covers all the dealers

registered with the State tax Department and in case of death of any registered dealer, payment of ₹ 5 Lakhs will be rleased immediately to the nominee(s).

A 24X7 help desk service is established at the State Tax headquarters as well as in the State Tax offices at Haridwar and Rudrapur for redressal of any difficulty with regard to the provisions of GST, especially regarding the preparation of e-way bills.

2.3 Non-GST Revenue

The State's Total Tax Revenue (TTR) has witnessed an increasing trend as the collections rose from ₹ 1393.23 Cr in 2002-03 to ₹ 20199.68 Cr in 2018-19. Uttarakhand's Own Tax Revenue (OTR) has been growing in absolute terms between 2002-03 and 2018-19. The State's OTR jumped from ₹1079.11 Cr during 2002-03 to ₹12188.09 Cr in 2018-19. The State excise as a percentage of own tax revenue declined to 14.21% in 2018-19, from 22.25% in 2017-18, which needs immediate attention and redressal, in order to reverse the trend. Stamps and Registration Fees as a percentage of OTR fell sharply to 5.02% of the OTR in 2018-19, from 8.68 % in 2017-18, which is in fact the lowest since the inception of the State. In this context, the State could envisage initiatives like setting up of independent evaluation boards for land property, and one-time settlement scheme for settling pending under-valuation, in order to garner more revenue from this source (RBI, September 2019)

2.4 Tax Sharing with Centre:

On the front of State's sharing of taxes with the Centre, Uttarakhand is one among the 13 States that received revenue deficit grants for FY 2020-2021 from the 15thFinance Commission. The State received a revenue deficit grant of Rs. 5,076 Cr. It also received Rs. 574 Cr grants to rural local bodies, which constitutes 0.95% share in the total grants made to the rural local bodies by the 15th Finance Commission. On the other hand, Uttarakhand received Rs. 278 Cr as grants to urban local bodies, which is also equal to 0.95% of the total grants made to the urban local bodies by the 15th Finance Commission.

Himachal Pradesh received a revenue deficit grant of Rs. 11,431 Cr for FT 2020-21, which is nearly twice the amount received by Uttarakhand. It also received Rs. 429 Cr grant to rural local bodies, which constitutes 0.71% share in the total grants made to the rural local bodies. Himachal Pradesh received Rs. 207 Cr as grant to urban local bodies, which is equal to 0.71% of the total grants made to urban local bodies. Both these grants are lesser than grants to Uttarakhand.

Against this backdrop, it is important to ensure tax buoyancy - the responsiveness of tax revenue to nominal GDP changes – is made robust. It is in fact a key, not only for own tax revenues of the State but also for the tax devolution from the Centre. More particularly, there is a need to have a clear operational distinction between short-run tax buoyancy, which helps to explain the role of government in stabilising the economy over the business/growth cycle, and long-run tax buoyancy, which is the capacity of the State to ensure fiscal sustainability in the long-run (RBI, 2019).

3. EXPORTS:

The State as the 19th largest exporting State of India in 2017-18, occupies a share of 0.48% in India's overall exports. During the period 2013-14 to 2017-18, exports from Uttarakhand registered a positive Compound Annual Growth Rate (CAGR) of 6.79% to reach USD 1.46 billion against a negative growth of -0.89% in India's overall exports.

Uttarakhand has two functional Inland Customs Depots (ICD) at Kashipur and Pantnagar. Land Customs Station (LCS) at Banbasa is proposed to be set up as Integrated Check Post (ICP) by Land Port Authority of India (LPAI). To facilitate movement of EXIM cargo from hinterland, the State has two Inland container depots (ICD) – one in Pantnagar and other in Kashipur.

In spite of being located near the industrial hubs, these ICDs witness very less amount of cargo due to infrastructural and connectivity issues, compelling exporters to send their cargo by road to other dry ports or directly to ports, which add to their transaction cost as well as lead to shipment delays. In terms of export value, ICD Pantnagar is the major port of export in the State, followed by ICD Kashipur and LCS Banbasa. In 2017-18, a gap of US$ 320.82 million was recorded between the total exports recorded by the State vis-a-vis exports through the above listed ICDs.

The State exported Pharma products worth over USD 100 million in 2017-2018 observing a growth of 11%. Some companies are contract manufacturing for big companies like Cipla and their products are sold domestically or indirectly exported. Most of the units have medium sized production facilities, however some enterprises have enhanced the level of their facilities and are in the process of overseas registrations for initiating their exports. Uttarakhand Tea Development Board has developed about 1185 Hectares of Tea Farming in Hilly areas of the State, which further paves the way for export opportunities in this sector. Production in 2018-2019 is expected to touch 75,000 kg, while it was 65,597 kg in 2017-18. Honey, Sugarcane, Basmati rice, mushrooms, processed foods, medicinal and aromatic extracts/oils, organic products and floriculture produce, have vast scope of growth for exports from the State.

4. INFRASTRUCTURE:

4.1 Renewable Energy

Uttarakhand is blessed with natural resources to support production of renewable energy by optimal harnessing of solar, micro hydro power, biomass, biogas and wind resources.

4.1.1 Solar Power:

Uttarakhand tops the list of hill States in terms of supply of solar power at 254.56 MW, while Himachal lags behind at 16.37 MW. North-eastern States also lag behind on this front. Besides being the cheapest source of energy, solar power is economical in terms of maintenance. Solar panels once installed at their maximum efficiency, require little maintenance. However due to the challenge for solar power on account of changing weather conditions and the possibility of cloud cover, there is a need to set up integrated power planta. This would not only assure a continuous power supply but also help to even out power fluctuations.

The State released its Energy Policy (Revised-2018), under which, establishment of solar power plants up to 05 MW has been reserved for residents of hilly areas in Uttarakhand. This policy is expected to increase employment in the hilly areas and prevent migration; especially to be considered in wake of the COVID-19 pandemic. Under this initiative, a total of 202 MW of combined capacity projects have been allocated to 283 developers till date. These need to be speeded up and supported. Undersolar energy promotion initiative, 12,000 solar lights have been installed in remote locations of the State, with the support of MNRE, GoI.

4.1.2 Hydro Power:

The total approved capacity of hydropower projects in the State is 24,551 MW, out of which 3,957 MW is under construction, while for 2,357 MW, DPRs have been approved. Under the Small Hydro Electric Project, power supply is expected to start on completion of installation of 200 KW capacity Hafla Small Hydro Power Project in Chamoli District and 50 KW Sela, Small Hydroelectric Project Pithoragarh.

A Memorandum of Understanding was signed between UJVN Limited and the Centre for Alternative Water Energy, IIT Roorkee for research and development of surface water electric turbines, in which surface turbines would be installed in canals. This would be a promising development.

4.1.3 Bio Energy:

The State is endeavouring to take advantage of the natural biomass resources available, for production of energy. As part of these efforts, two biomass briquette based power plants of combined capacity of 1060 kilowatts have been allocated to private developers under the Pine Needle and Other Biomass Based Energy Generation Policy-2018 in the State. Under this policy 21 projects have been allocated so far. It is envisaged to set up six thousand *Pirul (pine needle)* plants in the State. This initiative is expected to provide direct and indirect employment to about sixty thousand people

4.1.4 Wind Energy:

Uttarakhand, with its low-pressure belts and a mean annual wind speed of 5–5.5 m/s in some places of the State, has a good scope for the production of wind energy. Windmills have a life span of nearly twenty years and they are also energy efficient. In fact setting up of wind energy plants brings along with it, ample employment opportunities in the segments related to installation, manufacturing, operation and maintenance of wind turbines. Seasonal variations

in wind and the requirement of large-scale working capital, relative to the other sources of renewable energy, are the challenges faced by wind energy in the State.

Challenges and the Way Forward: While the State has been progressing on renewable energy front, there are several challenges it faces on the way such as (a) higher costs, (b) access to credit, (c) lack of availability of skill sets, (d) lack of strong institutional mechanisms, (e) inadequate infrastructure and investments and(f) uncertainty caused by sector specific issues, and policy changes due to judicial interventions. In order to make a paradigm shift towards qualitative improvement on all these fronts, strong policy directions, supported by strong institutional mechanisms for project implementation in mission mode and continuous monitoring of progress at highest level are necessary so that roadblocks are overcome in a timely manner, as soon as they are encountered.

It is in this context there is a need to focus on strengthening the research and development capabilities in the State that could further foster advancements in technology through innovations in this arena.

There is a need for continuous evaluation of the economic effectiveness of the policy instruments applied to achieve growth in renewable energy segments. It is worth considering the criteria of the International Renewable Energy Agency (IRENA), for evaluating the impact of policy instruments towards accelerated deployment of renewable energy sector. This necessitates policy focus on parameters like efficiency, effectiveness, equity, institutional feasibility and replicability. The State needs to envisage its future course of action on renewable energy front, and bring-in adequate policy changes and strengthening of implementation structures to put Uttarakhand on the top, in production and conservation of renewable energy.

4.2 Civil Aviation:

Uttarakhand has bright prospects on the front of civil aviation, due its wide variety of tourist attractions. Ministry of Civil Aviation, Government of India had launched the **Regional Connectivity Scheme (RCS),** which is also known as **Ude Desh ka Aam Naagrik (UDAN) on** 27 April 2017. The main objective of this scheme is to make the air travel affordable and widespread in the country.UDAN 2 (Phase 2, 2017) is expected to connect 43 airports and helipads with priority to the North-East and the hill States of the country. States with a maximum number of airports and helipads, which will see activation under the UDAN 2 scheme are Uttarakhand (15 airports), Uttar Pradesh (9 airports), Arunachal Pradesh (8 airports), Himachal Pradesh (6 airports), Assam (5 airports) and Manipur (5 airports).

Given the fact that the State is the biggest beneficiary in the country in second round of UDAN, it is imperative to explore the possibilities to widen its coverage. The State has its set of challenges that need to be overcome to succeed on the front of UDAN, where issues like (a) subsidies, (b) skills, and (c) financial viability require to be addressed successfully. Models of subsidies can be emulated from States like Madhya Pradesh and Manipur. With respect to the policies related to community participation in connecting remote areas, inspiration could be drawn from Australia's Remote Air Service Subsidy (RASS) model. On the other hand Telangana shows the way for pro-active policy initiatives on the front of addressing skill gaps.

In addition to this, the State has a unique potential for Heli services, given the tourist flow and geographical conditions. While Nepal offers policy insights into pressing Heli services for tourist needs as well as medical evacuations, the State could envisage policies that could create an eco-system that would contribute to the growth of this segment of civil aviation by addressing challenges like (a) infrastructure, (b) safety and (c) cost of medical evacuations. Effective policy interventions on these lines will not only help the State to reap the potential of Heli Services but also have the transformational capability that could create a sustainable structure, that ensures employment, inflow of high paying tourists and resultant prosperity to Uttarakhand in the times to come.

Potential to be a Maintenance Repair and Overhaul hub for aircraft should be tapped under the recent thrust announced for this segment by the Government of India.

5. EDUCATION:

The total number of students enrolled in Higher Education in Uttarakhand according to the Report of All India Survey on Higher Education (AISHE) for 2018-19 stands at 2,53,273 amongst which 1,25,037 are enrolled in private institutions, and 1,28,236 in government institutions. This number can go higher as AISHE captured the data only from those who responded to the survey. Enrolment in higher education at various levels is also encouraging with a total enrolment of 76,615 among which 462 are enrolled in PhD, 27 in MPhil and 71926 in Postgraduate levels. Another 19,612 students are enrolled in Postgraduate programmes through distance mode. The estimated number of enrolment in the colleges of Uttarakhand in Postgraduate programmes stands at 31,082 (Male: 12285, Female: 18797), which also indicates that women are surging ahead of men in college education. It also supports an earlier study that showed that the female enrolment surpasses male enrolment in almost every hill district. This pleasant number is rather attributable to the perennial reality of the hills –higher percentage of males migrating to the urban plains for both education and for jobs. The Gross Enrolment Ratio (GER) of Uttarakhand in Higher Education (18-23 years) stands at an overall 39.1% which is much higher than the national figure of 26.3%. This trend should be harnessed for the development of the State and channelized to develop a strong ecosystem of knowledge-based society.

In the area of Technical Education, the most striking fact that emerges is the low capacity utilization in undergraduate and postgraduate level institutions in the State. Out of the total intake capacity of 38,318 seats, only 17,769 students (Boys: 14,045, Girls: 3,724) were enrolled during 2018-19. Out of these enrolled students, only 8,011 found job placements at the time of graduation. This trend is not unusual as per the All India Council for Technical Education (AICTE) Report of 2019 that indicated that all India Capacity vs. Enrolment stood at a low 49.8%. Traditional engineering disciplines such as Mechanical, Electrical, Civil and Electronics engineering are increasingly witnessing low enrolment whereas disciplines like Computer Science still retain some interest. As highlighted by the AICTE Report (2019), (a) low enrolment, (b) minimal placements, and (c) low employability will pose more challenges in the coming years, as employment generation will be an uphill task for the State. Therefore, the technical institutions in the State have to rethink their strategies and proactively redefine their teaching-learning and quality scenarios with a view to incorporate 'employability' aspects within the subjects and curriculums they offer. Such a strategic reform can be facilitated by the Government and should invariably involve other stakeholders like industry, local entrepreneurs and SMEs.

Uttarakhand has seen substantial growth in the higher and technical education sector with a steady rise in the number of institutions and enrolment. But, now the new set of challenges that emerges includes - low employability, quality of teaching, educational planning at the institutional /local levels and a strategic reform of the sector. A new strategic action plan is necessary to respond to the 'changing nature of works' (2019) that will address the capacity-gap of the institutions with respect to students as well faculty, to move the State towards a global standard in competitive education that will churn out 'employable' graduates. The gaps in available seats and enrolment, graduation and placement indicate that time is already overdue for such an overhauling exercise.

Given this backdrop, there is a need for the State to reorient its education and training sectors – especially higher education and technical education. Uttarakhand should, therefore, rethink how its youth are educated, trained and developed today so that they fit into the work spaces of the future. The policy directions in this regard must be comprehensive, encompassing the complete life cycle of an individual and, in the larger scenario, the entire population of the State. Any policy intervention in this direction needs to acknowled--ge that three major paradigm shifts are happening at present in - technology and globalisation, education and training ecosystems, and repositio--ning gender as a paid workforce. A detailed discussion on the policy directions in this regard is available in the chapter dealing with higher and technical education.

6. HEALTH AND WELLNESS:

Since its inception in November 2000, the State has made considerable progress on the health front. The State has performed well in terms of several health indicators, and stands in a better position than the national average, while it lags behind in other key indicators. Uttarakhand's broad health indicators like, birth, death, infant mortality rates and maternal mortality ratio have improved remarkably, while indicators including access to primary and secondary medical care, ante-natal care, immunization coverage, anaemia and malnutrition, continue to lag behind. In recent years, the State has witnessed a surge in some communicable (Tuberculosis) and non-communicable diseases (diabetes, HIV/AIDS, hypertension), attributable to life style changes.

There are several challenges faced by the State that hinder progress in its endeavour to achieve its health vision. Some challenges such as the State's topography, scattered *riven to demand driven*, *putting in place policies and* habitations and lack of all weather roads are inherent and difficult to be addressed. The State has struggled to deploy medical doctors in its health facilities, which have been facing chronic shortages since the inception of the State. The State needs to adopt alternative strategies in light of its past two decades of experience to cater to the medical care needs of its population, especially in hilly and remote areas. One of the strategies could be to build promote good preventive health care and health seeking practices, thus reducing the disease burden and resulting in well being and better quality of life for the people. This will allow the State to redeploy resources to cater to more serious ailments and procedures.

Some transformational strategies,which need to be deployed in concert, are proposed belowwith the intention to foster debate followed by strong and concerted action in mission mode.

Social Behavioural Change Communication (SBCC) - The Central Strategy:

Other challenges such as lack of access to good quality medical care, gaps in medical personnel in hill districts, poor immunisation coverage, malnutrition, emerging communicable and non communicable diseases can successfully be addressed by recognising the limitations in terms of chronic shortage of medical personnel since inception and taking a bold step of undergoing a *paradigm shift in approach to public health from supply driven to demand driven*, *putting in place policies and strategies, which make household level behavioural change, in terms of child bearing and child rearing practices and good health seeking practices, as the central strategy. This would require redeployment of government health functionaries as counsellors and agents of behavioural change, in addition to their regular medical duties.*

Revisit the State Health Policy 2002: The State Health and Family Welfare Policy 2002 needs to be revamped based on the experience of previous two decades, recognising the current realities and limitations, support the State SDG goals and targets elaborated in Vision 2030, it should reflect the emerging healthcare needs of the State's residents including management of health disasters such as COVID-19, and devise cogent strategies to address the same effectively, taking on board relevant national and international best practices.

Quality of Healthcare – Renewed Focus And Change of Approach Required: The State Heath Policy lacks mention of how does the State intends to ensure quality of its health care services. This needs to change with clear policy statement on what is the State Vision on Quality of Health Care Services and what strategies does the State intend to adopt to establish **quality of care as a core value** in all its health care facilities. This requires a culture change within the health care facility staff of each health facility. This is best done on-site and whole site, by teams of dedicated professionals, **Quality Champions** in each health care facility, who do not limit their support to documentation and inputs to achieve prescribed quality parameters for certification purposes. Instead the hospital teams should work towards team cohesiveness and team pride in improving quality of services in all aspects of hospital services with focus on good outcomes for patients and patient satisfaction.

Deploying Technology – Bringing Medical Care Closer to People: In order to bring good quality healthcare services closer to the people in the State, keeping in view the scattered and remote locations of villages, especially in the hill districts

and well aware of the long continuing challenge of attracting medical personnel to work in the hill districts (the State has one of the lowest doctor population ratios in the hill districts), it is an urgent need to devise innovative strategies to fill the wide gap in access of citizens to health care services. One of the tested and widely available solutions is telehealth (which term used here includes all its sub-branches such as tele-radiology, teleobstetrics, tele paediatrics, tele opthamology etc.). The experience of tele-health in some pockets of the State needs to be rapidly rolled out to cover the entire State. PPP route for quick roll out could be adopted.

Making Health Functionaries More Effective Reskilling & Supportive Supervision: In order to achieve the challenging targets of Uttarakhand Vision 2030, it is necessary to optimally utilise the available heath care staff and functionaries. This can be achieved in two ways.

One would be to reskill, multi skill and enable them to cater to the changing health care needs of the population, such as non-communicable diseases, mental health and geriatric care and emerging communicable diseases such as COVID -19. Increasing use of high quality standard treatment guidelines and support through tele-health technologies can make them many more times effective than at present. Multi-skilling would have a beneficial impact of boosting their sense of pride in newly acquired proficiency and enable them to stand out amongst their peers.

Second part of this strategy entails bringing in higher levels of accountability in the functioning and performance of the health care facility staff by establishing well defined roles and responsibilities , setting annual performance targets and defining clear and measurable performance indicators linked to incentives and recognition.

Ayurveda, Yoga, Unani, Sidha and Homoeopathy (AYUSH) Systems – Harnessing Their Well Being Potential: Uttarakhand has acquired the distinction of being the Yoga capital of the World and students and practitioners from within the country and from several countries enrol to learn and practice this system of well-being. This position must be leveraged to expand the number of centres at carefully identified locations all across the State, improve quality of facilities in these centres, enhance the skills of Yoga teachers and the services provided in these centres, to attract a growing number of students and clients.

The State has announced AYUSH Policy 2018, whereby it intends to facilitate integrated programmes on management and prevention of lifestyle diseases though public health activities, propagate science of healthy living; manage wellness centres under NHM; develop AYUSH township, promote AYUSH Grams as centres of wellness and rejuvenation; encourage Yoga Grams and Centres to be established as state-of-the-art Yoga and meditation centres and foster AYUSH Wellness Resorts. *An empowered task force needs to provide the stewardship to realise these policy intentions.*

Preparedness for Medical Disasters/ Pandemics: The State requires to prepare a comprehensive disaster preparedness and management plan to successfully tackle COVID-19 like pandemics and other adverse health events, food poisoning incidents, natural calamities, landslides and accidents. The health disaster preparedness plan would include acquisition of necessary equipment and their assessed need based distribution in all districts, stockpiling of essential supplies, medicines, personal protective equipment, testing facilities, preparation and dissemination of standard operating procedures and standard treatment and safety guidelines, training of all health personnel and rapid deployment of isolation facilities for prompt and effective management of pandemics and treatment of communicable diseases of unknown nature, while safeguarding themselves and isolating the infected patients. Modular, movable and quick erection technologies for setting up isolation hospitals within 2-3 weeks must be explored and used instead of undertaking long gestation civil construction.

7. WATER RESOURCES AND SECURIT Y :

Uttarakhand is endowed with more than adequate water resources being home to Gangotri and Yamnotri, the origins of rivers Ganga and Yamuna respectively. Water security is a critical area of concern for Uttarakhand as it has a score of only 49 in the Composite Water Management Index (CWMI of NITI Aayog). This score places it in the low performing States having scores of less than

50. On the other hand Uttarakhand is a large beneficiary of the Indian Himalayan glacial system. There are 1,439 glaciers in Uttarakhand Himalaya covering a total area of 4,060 km^2. Despite the rich water resources, the State is confronted with many challenges on the front of water security. They range from over extraction of ground water to lack of a ground water policy, and from data issues to recession of glaciers. In this context, the State may envisage measures like (a) Integrated Water Resources Management (IWRM), (b) Water security management based planning, (c) tightening of the ground water legislation, (d) better management of the precipitation within the State, (e) incorporating traditional and indigenous knowledge, (f) promoting community awareness and action, (g) strengthening of institutions, (h) reversing glacial recession, (i) enhancing data collection capacity and capability, (j) using the water lens for development of policies and incentives related to agriculture, (k) development of block level and urban area water management committees and (l) incentivizing mechanisms for water conservation at individual and community level. These efforts on the policy front would go a long way in promoting water security of the State.

8. GROWTH DRIVERS-PRIMARY SECTOR:

The contribution of agriculture and allied sectors to the State Gross Domestic Product (SGDP) in Uttarakhand and Himachal Pradesh have been falling significantly. The crop sector share in SGDP of Uttarakhand has declined from 7% in 2011-12 to 4.7% in 2018-19, as growth in the other sectors was much faster, resulting in a net reduction in the share of agriculture in GSDP from 25.51% in 2000-01 to 10.81% in 2018-19.In this context it is to be noted that the diverse agro-climatic conditions and the varied soil characteristics makes the State suitable for cultivation of a variety of high-value seasonal and off-season crops along with fruits, vegetables, flowers and other cash-crops. This major strength of the State needs to be exploited. It is also pertinent to note that the yields from horticulture crops are more than the open field crops like paddy and wheat. Horticulture crops are more suited to hill climate and topography. Horticulture sector holds tremendous potential to increase farm income.

The Directorate of Agriculture and the Horticulture Department have been putting in efforts related to implementing and supervising selected programmes and policies in the State using Central and State financial resources. However, it is true that despite such efforts, the situation at the farm level is below expectation.

Most of the policies, especially those under 100% sponsorship by the Central government are being implemented, but the policies per se do not often benefit the target population. The policies are too top-down in nature and the requirements of the beneficiaries are not accounted for in the design and execution of the schemes. Few reasons behind slow subscription and/or participation of farmers in these programmes are - (a) lack of awareness, (b) lack of experience and (c) hesitation to innovate. In addition, the confusing and at times complicated procedures, and uncertainties with regard to actual release (or receipt) of funds, makes the programmes discouraging.

It is widely accepted in policy studies and research, that every policy needs to be assessed in terms of its impact not only on raising productivity, income and livelihood opportunities but also in terms of the beneficiaries' experiences, which may motivate future participation in government sponsored projects and programmes.

The increase in low productive marginal and small farm holdings in the State is a matter of great concern and forces one to evaluate the efficacy and impact of farm level policies in the State.*The solution towards enhancing economies of scale from the increasing number of marginal and small land holdings could be to lay emphasis on alternatives institutional arrangements such as formation of marginal and* ***small farmers' co-operatives, contract farming,*** *and interventions through groups formed with the support of micro-finance and micro-credit initiatives, involving women self-help groups and promotion of local level consortia.*

To ensure fulfilment of the objectives of ***Doubling Farmers' Income*** (DFI), improvements in markets for agricultural products, assurance of better prices, easy access to credit and farm income insurance, protection against extreme events, technology adoption in weather information processing and dissemination to reduce

production losses are key steps. The seven sources identified by the Ashok Dalwai Committee are:

(I) *Improvement in crop productivity;*

(ii) Improvement in livestock productivity;

(iii) Resource use efficiency or saving in cost of production;

(iv) Increase in cropping intensity;

(v) Diversification towards high value crops;

(vi) Improvement in real prices received by farmers;

(vii) Shift from farm to non-farm occupations.

***Hill agriculture** can become **a growth driver** if and only if policy-making acknowledges the climate threats, includes community perception in framing adaptation policies and encourages participation of all through structured dissemination of scientific knowledge to those who may be currently distant from adopting modern technology*.

*If the projected increase in area under cultivation of organic crops and the associated increase in the farmer participation is realised, the State may also consider crop specific introduction of **crop insurance schemes**. In the long run, steps may be taken to develop a separate online market for organic produce (using mobile applications) so that the demand and supply uncertainties are reduced.*

Cooperatives in the State are playing a significant role. *Government should promote these institutions and provide better rules and regulations that can increase the flexibility of the registered societies, guide formation of new societies and engage in thorough assessment and impact evaluation of the programmes towards income increase, livelihood diversification and overall rural development. Thre is a strong case for initiating the Integrated Cooperative Development model in Uttarakhand for future development of the State.In this model, it is proposed that different Departments, which could bring harmony to the primary sector, may be integrated for better action-oriented policies in the State for welfare of its people*.

Agro-Climate Specific Interventions: There is a need to expand agro-met services in the State including interventions designed based on locale specific agro-climate.

Assessment of Impact in Terms of Number of Beneficiaries: The State is implementing many schemes but the policy should recognise that disclosure on the number of actual beneficiary farmer households is important to assess the effectiveness of the programme.

Dissemination of Best Practices and Support to Upscale: There are many pilot programmes being implemented in the State at the village/community level by non-governmental organisations. The successful models should be scaled up and adopted by the State for benefit of rural communities.

Adaptation to Climate Change: Given the challenges the State may face due to growing climate change concerns, the State policy as well as the Vision documents should prioritise public led climate adaptation.

Usage of Insurance Products: The State needs to publicise the potential benefits of insurance and consider subsidising such products. Apart from the fully modified and restructured PMFBY, there is need of farm income insurance (agriculture and horticulture crops), livestock insurance, insurance of agri-products being transported to the *mandis* in the plains and disaster insurance.

Disaster Mitigation and Risk Coverage: Promotion of community involvement in prevention of fires is called for. "No Smoke in The Valley Awards" may be instituted for Gram Panchayats.

Improving Cropping Area and Cropping Pattern: The falling trend of area under production/cultivation of many important crops would be an unacceptable scenario for these enterprises in the long run. The State needs to push for the first mover advantage and therefore focus on addressing the deteriorating cropping pattern.

Shift to Horticulture: Conversion to horticulture crops is also proposed because monetary rewards from engaging in such activities are higher than traditional crops.

Value from Agricultural Waste: In recent times, burning of agricultural wastes has been identified as a major contributor to the problems of climate

change. Available technological solutions to such problems must be harnessed such as use of the husk from farms for electricity production. Post-harvest value creation or addition of agricultural waste is an untouched area.

9. GROWTH DRIVERS-TOURISM:

Tourism in Uttarakhand revolves around its natural heritage. UNWTO, in its 2019 report, has identified travel to 'change' as the key consumer travel trend whereby travellers seek authenticity and transformation.

There should be sustained strategic efforts to offer tourism products developed around the organic personality of the State of Uttarakhand. Pristine, unspoilt nature is the core resource. Uttarakhand should focus on **transformational tourism** where key products would include- Spiritual (religious) tourism, Nature-based (eco-tourism, herbal tourism, wildlife photography) tourism, Advent-ure (mountain-based, and river-based) tourism, Wellness (Yoga, Ayurveda) tourism and Rural (including gastronomic tourism, handicrafts) tourism.

The State has a Tourism Policy (2018),which accords 'industry' status to tourism, offering incentives for investors in this sector.

Strategic directions for tourism growth in Uttarakhand are:

- A specialised product focused on health and well-being in the form of transformational tourism may be offered.
- This transformational tourism tag will offset the challenge of the seasonality of *Char-Dham* Yatra when it is not being organised
- Transformational tourism products will act as supplementary products during the yatra time, and thus, the same will ease up the crowd management
- Transformational Tourism, which has been acting as a supplementary product during the yatra time will become the core product of Uttarakhand when yatra is not taking place.

Strategic Interventions

1. Focus on tourism yield rather than tourist traffic alone.
2. Create a separate cadre of Tourist Police, which can multitask for first-aid, tourist information, roadside assistance, traffic controller etc.
3. Have a traffic policy in place for tourists - differential parking and tolls to encourage visitors to leave busy locations for outskirts.
4. Provide for capacity building, especially for homestays, adventure sports, culinary trades, wellness instructors, disaster management, etc.- under the MoT, GoI's capacity building schemes.
5. Promote rural tourism entrepreneurship and provide for incubation and hand-holding.
6. Policy for low impact tourism and hospitality infrastructure, including sustainable vernacular architecture.
7. Distinct promotional campaigns for domestic segments and inbound segments. Extensive use of social media for promotion.
8. There should be continuous research and customer feedback monitoring

Tactical Moves

1. *People involved in tourism related activities, including transporation should be trained in hygiene, cleanliness, waste management and prevention of infection to offer tourism experience free of worries from infections like COVID-19.*
2. Better inter-departmental coordination. An empowered and strengthened UKTDB may serve as a facilitator for coordination among various departments like forests department, rural development, urban development, culture, AYUSH, Police, PWD, Gram Panchayats, etc.
3. Identify and develop micro destinations for slow tourism. Such destinations should focus on weekend urban market and should be well connected to them,
4. An annual calendar of fairs, festivals and cultural fests in the State should be created well in advance. There should be fixed dates for major events. Information should be made available to the public and intermediaries well in advance.
5. All departments concerned with the creation of tourism infrastructure or its maintenance should have an earmarked budget allocated

for tourism related activities like maintenance of the roads, hygiene and sanitation, electricity, CCTV and these departments may jointly set priorities and monitor progress with the Tourism Dept.

6. Marketing should use highly creative methods and content. Effective use of social media should be made.
7. Measures should be taken to deal with seasonality and the creation of theme-based circuits.
8. Effective steps should be taken for the regulation of traffic, especially in pilgrimage sites and ecologically fragile zones.
9. Village development plans with a tourism component should be discussed at the Gram Panchayat level. More the ownership of the host communities, dispersal of tourism benefits will set off a positive cycle.
10. More training and skill development programmes should be organised for community-based tourism.

10. GROWTH DRIVERS – Micro Small Medium Enterprises (MSMEs):

The Micro, Small and Medium Enterprise (MSME) sector plays a pivotal role in the State economy, by contributing not only to employment and output but also promoting inclusive growth. MSME sector made an exponential progress over the years since the formation of the State. The State had 14,163 MSMEs, with an investment of Rs.700 crore and provided employment to only 38,509 people when it was formed. In two decades, MSME sector emerged as the second largest employment generation sector of Uttarakhand, with the first being agriculture sector. At present there are 53,000 MSME units, with a capital investment of Rs. 10,960 crore, and generating employment to 2,58,000 people. The State envisages to establish 1, 70,000 MSME units, with a capital investment of Rs. 36,000 crore, that could generate employment to 8,50,000 people by 2030.

The larger State specific challenge is the regional disparity among the hill and plain districts of the Uttarakhand, in terms of number of MSME units, investments and employment generation. The State has been adopting several measures over a period of time to address these issues and envisages further policy interventions in the time to come. These policies range from provision of incubation and Supply Chain Support for Rural Enterprises, Skill Development through Vocational Training, cluster approach to MSMEs in districts and improved marketing.

Bringing in more flexibility in the labour regulations, rejuvenating the State's Start-up Policy, enhancing financial literacy, and technological up gradation of MSMEs in the State and investment in key promotional infrastructure like rail and road connectivity, logistics hub, CETPs Policy interventions on this front could potentially take the MSME sector in the State to new heights. The policy stance of the State towards MSMEs and their gaps are discussed in detail in the chapter dealing with MSMEs.

11. Ease of Doing Business (EoDB):

Uttarakhand is making new strides on the front of Ease of Doing Business by improving its performance on various parameters of its assessment. Currently, it tops the list of EoDB among all hill States in the country, which in itself speaks volumes about the amount of effort to achieve this status within a short span of time.

The Department for Promotion of Industry & Internal Trade (DPIIT) along with World Bank initiated the Business Reform Action Plan (BRAP) in 2014-15. These assessments have been done for 2014-15, 2015-16, 2016-17, and 2017-18. For 2018-19 the State will be assessed only on the basis of feedback received from the users/industries on these 80 reform points in which the State did not score very well in the last year. The result of 2018 -19 is yet to be declared, as this chapter went to press

11.1 Destination Uttarakhand:

The State Government has been working in a mission mode to make Uttarakhand a hub for investments. As a part of these efforts, the State had organized an investor's summit 'Destination Uttarakhand', from 07-8th October 2018. During the summit, 601 Memoranda of Understanding (MoUs) worth nearly Rs.1.24 lakh crores were signed.

Despite these achievements Uttarkhand still faces challenges on the front of EoDB. The fact that there is a large gap between the scores of feedback

and reform implementation suggests that there areunderlying fault lines and highlight the need to bring in reforms in the existing Single Window System as there are several windows behind the single window which are to be negotiated by potential investors causing delay and wasteful expense. Hence the present rankings of the State could be sustained and improved in the years to come by addressing these issues through policy intervention and drawing lessons from the experience of other successful States. While the State is documenting whatever it does, it is equally important to do whatever it documents.

12. Data for Decision Making:

The IT sector in the State of Uttarakhand has consolidated its strengths by digitizing many of the public services, especially by provisioning these services through the Common Service Centres (CSCs), e-District, State Wide Data Network (SWAN), State Data Centre etc. In addition, the IT perspective of Government of Uttarakhand as per the Vision 2030 document is very promising. The projects undertaken by Space Application Centre, Department of Science and Technology are also very promising. However, there are two major lacunae in the current eco-systems of information systems used by various government departments.

Firstly, the data and information collected through various systems is not integrated.

Second, the data and information is idle and not being analysed to increase the effectiveness of government departments, their services, policy design and monitoring. Therefore, it is recommended to establish a "Cloud and Data Centre for Analytics" (CDCA) that shall facilitate data driven decision making to decision and policy makers by integrating various data sources and promote usage of various techniques like machine learning, artificial intelligence, image recognition, speech recognition and synthesis, deep learning and chatbot / voicebots.

The State requires a policy direction to establish Process Monitoring as an essential and integral part of all programmes supported by State and National funds.

13. Entrepreneurship Development

Entrepreneurial footprint in the growth story of Uttarakhand, is limited. The top three districts with highest per capita annual income also have highest number of people working as employees. In addition to State Government efforts, sustainable entrepreneurship development in Uttarakhand will need a transformational approach, as mere incremental steps may not be able to provide the required growth. The focus must shift from creating 'manufacturing' enterprises to 'knowledge centric' enterprises. This requires investments in multi-layered value chain of products and services, based on the natural strengths of the state.

A shift from production centric / manufacturing centric economic outlook to knowledge centric economic outlook for the State, leveraging the natural strengths of the State by making a value Chain / Supply Chain analysis to connect cottage industry-MSME- large industries in an integrated chain, re-examining the entrepreneurship development programmes and upgrading them in terms of content and training methodology, developing & maintaining a for public database successful / innovative entrepreneurial initiatives across the state to inspire local aspirants, are some of the measures that could take the entrepreneurial culture in Uttarakhand to new heights.

14. Policy Outlook:

As the Economic Survey goes to press, The COVID-19 pushed the global economy into an unprecedented global health emergency. As a result, the world economy that had grown at the rate of 2.9% in 2019 is estimated to record a growth rate of around one per cent, according to the Institute of International Finance (IIF). India too has to face its wrath and it is evident from the revised growth projections. For instance Fitch solutions had cut down India's GDP growth estimates for the coming fiscal year 2020-21 to (-)5%, due to contraction in investment, weak private consumption amid the outbreak of deadly corona virus. Moody's too had slashed down India's growth forecast for the fiscal year 2020-21 to 0% and this is likely to be further revised downwards. Given this global and national scenario, it is apparent that Uttarakhand too would see its growth prospects dipping, due to these developments.

This is due to the fact that, to deal with this unprecedented health emergency, both the Union and State governments had resorted to lockdown and thus the economic activity had come to a grinding halt. The immediate priority at hand is to save lives initially and then the livelihoods. While the State has been successful in containing the spread of the Corona virus and saved millions of lives, the next immediate challenge at hand is to save livelihoods. The State is bracing up for a phased easing from the lockdown and is expected to revive economic activity.

However it is to be noted that the crisis that the State faces today is altogether a different one in comparison to the other crisis situations it had met on the economic front earlier. While the Reserve Bank of India has provided monetary easing to ensure liquidity, the State needs to be cautious in the application of its fiscal policy. Any discourse on further policy to handle this extraordinary situation needs to understand the impact of an overall expansion of monetary and fiscal policies on the state of the economy. In this context, it is to be noted that at present, the consumption demand in certain sectors is rising, given the nature of the problem and it had fallen drastically in other sectors due to complete lockdown. The huge demand for health services, related health equipment and auxiliary products related to it, shot up thereby raising their prices. As a result, the regular users of these services would find it difficult to buy them once the economy re-starts. On the other hand sectors like tourism, hospitality, aviation, automobiles and manufacturing touched rock bottom due to the economy coming to a grinding halt, posing a serious crisis on employment front. In addition to this, there are inter-sectoral linkages that cannot be ignored, where the transmission of prices takes place through various channels and thereby has a multiplier effect. Given this backdrop, a blanket expansionary fiscal policy for all the sectors could result in spike in prices in those sectors, where demand already is high, making life of regular buyers of these goods and services tougher than earlier, as they would be left with less purchasing power. This would raise a new macro-economic challenge making it increasingly difficult to revive economic growth. Thus policies aimed at fighting the looming economic crisis need to discriminate between sectors that are facing slowdown from those that are in boom now, while attempting to address the growth concerns. On the other hand there is a need to increase the purchasing power of the people while taking into account, the inter-sectoral linkages.

In the long term, the State needs to focus on developing alternative strategies of creating competitive advantage in the manufacturing sector. In the absence of large domestic market or reserves of raw material, the State faces a challenge in maintaining competitiveness in attracting newer industries. Some of these challenges can be partially addressed with improvement in the supply of skilled workforce at competitive rates, development of local entrep-reneurship and ensuring availability of cheap and abundant electricity based on renewable energy. To make the workforce more skilled and to develop the culture of entrepre-neurship, requires investment in human capital development. There should be professionally managed identification of skill gaps and adequate emphasis on the cultural aspects of entreprene-urship. This could help the State to trek the path of a sustainable growth trajectory.

CHAPTER 2
Macro-Economic Aggregates

Abstract

The State GDP for the year 2018-19 at current prices is ₹ 2,45,895 crore (Sizeof the Economy) showing a growth rate of 10.35 % over the previous year. The State's GDP at constant prices of 2011-12 for 2018-19 is ₹1, 93,273 crore, showing a GSDP growth rate of 6.87% over the previous year.Per capita NSDP at current prices i.e. per capita income of the State is estimated as ₹1,98,738 for theyear 2018-19 recording a growth rate of 9% over the previous year. Contributions to State'seconomy from primary, secondary and tertiary sectors were 10.57%, 48.93% and 40.50% respectively. The contribution from the secondary sector as well as primary sector has come down.

Total advances of banks as well as credit to deposit ratio has increased from 2017 to 2019. Shareof Priority Sector Advances in total advances decreased during 2017 to 2019. It indicates the slowing down of unorganized sector. Lowering of the agricultural contribution to GDP, per say is not a bad thing, provided the share of workforce, employed in agriculture also comes down to the level of share in output. Since, that is not the case, there is a need for strategies to prevent slowing down of secondary sector along with revival of agriculture. Uttarakhand witnesses a high per capitaincome in comparison to the national average, however it too has substantial degree of inequality.

2.1 Introduction:

Macro-economicindicator GSD Pat current prices is an indicator of the size of the economy while NSDP at current prices indicates its value after deducting depreciation during production process. The State Gross Domestic Product for the year 2018-19 at current prices is ₹2,45,895 crore (Size of the Economy) showing a growth rate of 10.35% over the previous year. The State's GDPfor2018-19, measured at 2011-12 prices, is estimated at ₹1,93,273 crore, showing a growth rate of 6.87% over the previous year.

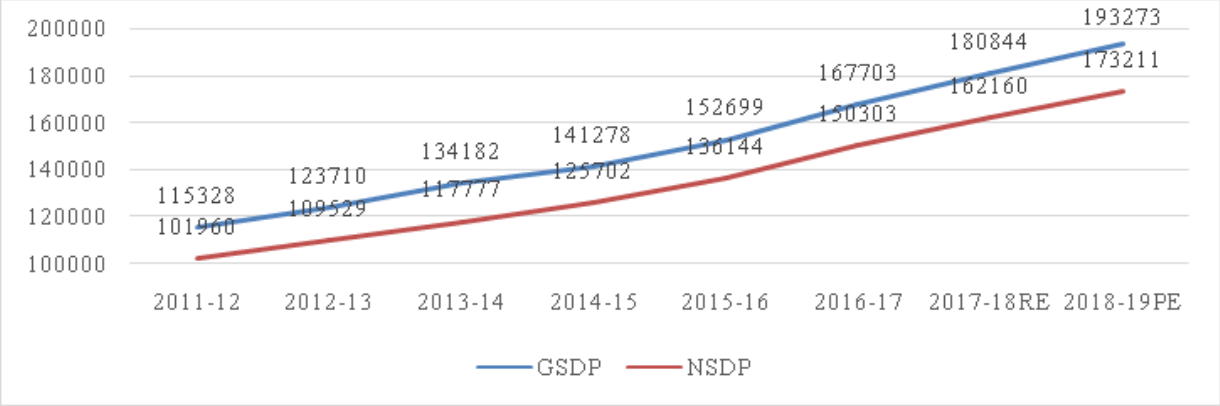
Since2011-12, Uttarakhand's GDP, bo that current and constant prices shows a rising trend. Per capita NSDP at current price of the State is estimated as ₹1,98,738 for the year 2018-19 recording a growth rate of 9.0% over the previous year.

The sectoral composition of GSDP in Uttarakhand economy is dominated by the Secondary Sector, which contributed 48.93 % of the State GDP. This is in complete contradiction with the national scenario, where Tertiary Sector dominates the GDP. However, the Tertiary Sector in the State is growing at a relatively higher rate, resulting in increasing share of Tertiary Sector and marginal decline in share of Secondary Sector in the State economy. The Tertiary Sector in FY. 2018-19 has contributed 40.5 % of GDP. The Primary Sector's contribution to GSDP is 10.56%. Provisional estimates for2018-19, at current prices, reveal that Tertiary Sector grew at the rate of 12.48% followed by the Secondary Sector at 6.94% while the Primary Sector lagged behind with growth rate at6.92%.

2.1.1 Comparison

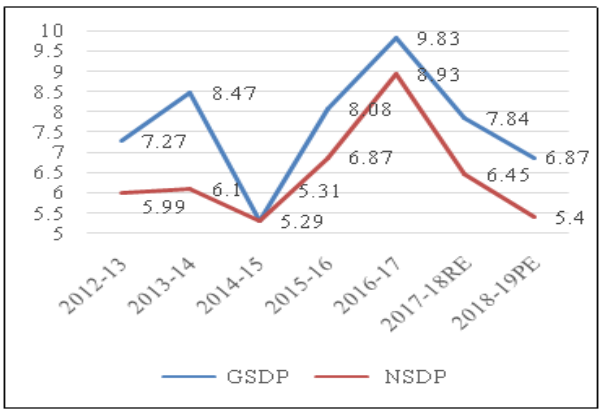
In comparisonto the national scenario, the State has shown better results. In 2018-19, provisional NDP (income) growth rate of Uttarakhand at 2011-12priceswas6.87%while at the national level it was 6.8%. For the same year, at the 2011-12 prices, the average percapita income ofthe Uttarakhandwas₹198,738, which wasmuch higherthantheall India average per capita income of ₹126,406.Further, roughly half of the value addition (income) in Uttarakhand comes from industries, which is commensurate with developed countries' historical experience of transformation of the economy from the pre-dominantly agricultural economy to a modern economy. Whereas, at the national level, roughly 25% of value addition comes from industries and as this is very low, globally it is considered as an exception to the general trends in transformation of the economy from agriculture dominated to a modern economy.

Fig 2.1: Gross State Domestic Product (GSDP) and Net State Domestic Product (NSDP) and Inflation:



The GSDP and NSDP estimates at constant prices show a real increase in the output of an economy while excluding the rise in prices during the estimated period, providing a real picture of growth of an economy. These two indicators have shown a continued increasing trend since the formation of the State. From 2011-12 onwards, the economy's production and income is expanding at largely similar rapid pace.

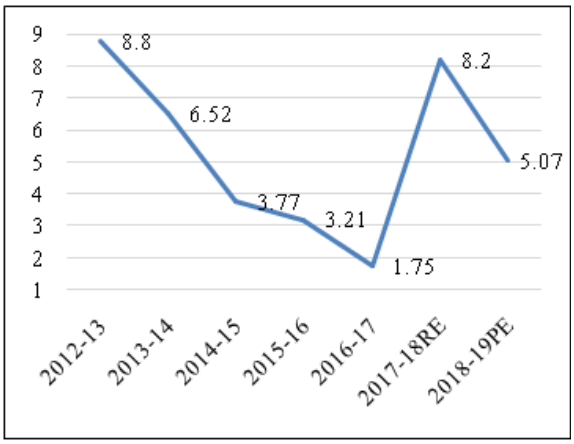
Fig 2.2: Real Growth Rate of GSDP and NSDP (in %)



However, both the growth rates of GSDP and NSDP have shown substantial fluctuations. In 2018-19 these growth rates showed dips in comparison to the growth rates of the previous two years. Still these growth rates in FY 2018-19 are higher than of FY 2014-15. The real GSDP and NSDP growth rates in FY 2018-19 are 6.87% and 5.4% respectively. The GSDP has been growing at a higher rate than the NSDP growth rate. This indicates that the amount kept aside for depreciation is increasing over the years. Since Uttarakhand is a relatively new State, existence of very old capital stock is more unlikely, indicating increasing capital formation in the State.

GSDP growth rates though depends unpon many factors but due to covid – 19 it is likely to show substantial dips in 2019 -20 and the coming year 2020-2021 as some of the studies says. The situation may also negatively affect the capital formation process.

Fig 2.3: Inflation Rate Calculated from NSDP Deflator (in %)



The inflation rate calculated from NSDP deflator shows a decline in inflation in the State during FY 2018-19, in comparison to the previous FY 2017-18. So the economy during the last one-year can be termed as an economy with moderate growth with moderate inflation. However, if we look at the entire period of 2012-13 to 2018-19, the inflation rate is not very stable. Instability is generally bad for the investment environment of the economy. Given the lack of availability of data, it is difficult to say what is causing these fluctuations in inflation - the demand side factors or the supply side factors or a combination of both. Further, there may be sectoral disproportionality, arising due to lack of integration among different markets.

2.1.2 Per Capita Income

Per capita Income or the average income of population in an economy serves as an indicator of the average improvement in the living standards in that economy. Per Capita Income of Uttarakhand is higher than the national average. The average per capita real income of Uttarakhand (measured at average per capita NSDP at 2011-12 prices) shows a continuous increase. For the last 3 years, i.e., FYs 2016-17, 2017-18 and 2018-2019, the average per capita real income in Uttarakhand was ₹161,172, ₹182,320 and ₹198,738 respectively. While at the national level this was estimated as ₹104,659, ₹114,958 and ₹126,406 respectively for the same time periods.

Post covid -19, many people returned to their native places from cities of Uttarakhand and others states. Most of these people are either unemployed or in search of new jobs or enterprises. Such situation may endure for some more time. A substantial percentage of people have already lost their incomes. This is definitely going to effect the growth of per capita income of Uttarakhand in 2020 - 2021 and in the coming years.

2.2 Structure of the Economy:

2.2.1 Dynamics of Sectoral Composition of Uttarakhand Economy

Uttarakhand's economy has been expanding and experiencing structural changes since the formation of the State. In the initial years of the State, the Tertiary Sector's contribution to the GSDP was higher followed bythe Secondary and then the Primary Sector. However over a period of time, the Secondary Sector has started contributing more, followed by Tertiary and then the Primary Sector in that order. In fact, at the beginning of the current decade, more than half of the value addition in the State was happening in the Secondary Sector. In FY 2016-17, the contribution of Secondary sector was 50.2% and the contribution of Tertiary Sector was 38.97%. However, by the year 2018-19, the contribution of Secondary Sector declined to 48.93% and the contribution of Tertiary Sector went up to 40.51%. This marginal slowing down of Secondary Sector may be caused by two factors - the industrial production at the national level is experiencing a slowdown and that may be getting reflected in

Figure 2.4:Sectoral Contribution to Gross State Value Addition (AE) atCurrent Prices, 2018-19 (in %)

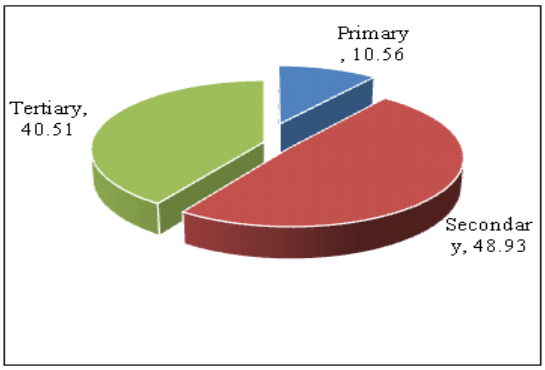
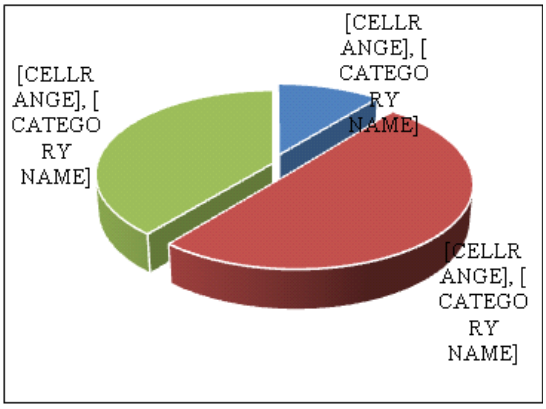
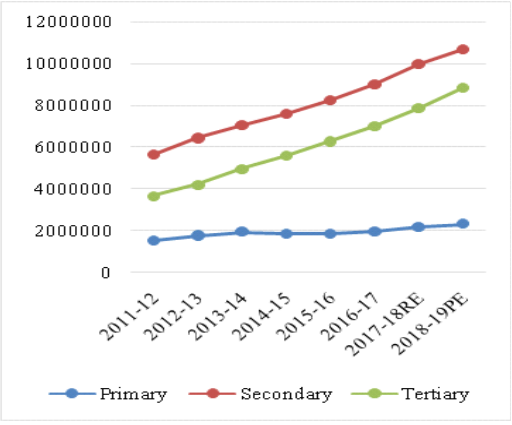


Figure 2.5:Sectoral Contribution to Gross State Value Addition (AE) at Current Prices, 2016-17 (in %)



Uttarakhand also. The second possible reason may be due to the adoption of GST at the national level, the special tax incentive to set up industries in Uttarakhand have come down from July 2017 onwards indicates an increasing trend in Secondary and Tertiary Sectors.Tertiary Sector has been largely rising parallel to Secondary Sector. However, from 2018-19 there is seen a tendency of Tertiary Sector rising faster than the Secondary Sector. The Primary Sector has shown signs of revival from FY 2017-18 onwards.

Figure 2.6: Trends in Output (at current prices) of Different Sectors



2.2.2: Dynamics of Sectoral Contribution with-in the SecondarySector:

As already pointed out, around half of the GDP in Uttarakhand comes from the Secondary sector. More than 76% of the Secondary sector consists of manufacturing sector; Construction sector contributes around 7%. However, a comparison of the current year 2018-19 with the year 2017-18 shows a decline in the manufacturing sectors. In fact overall fall in output in the Secondary Sector is largely due to the fall in the manufacturing sector.

Figure2.7: Contribution of Different Sectors within the Secondary Sector (%)

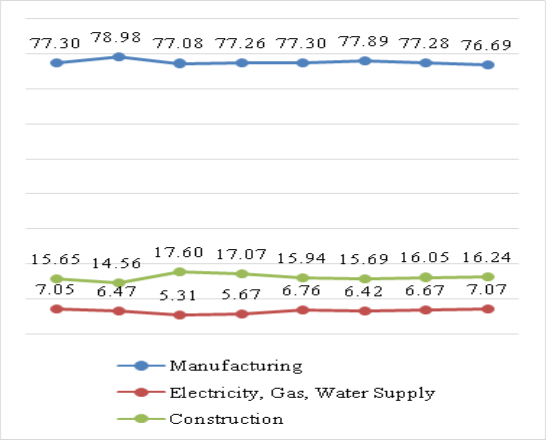
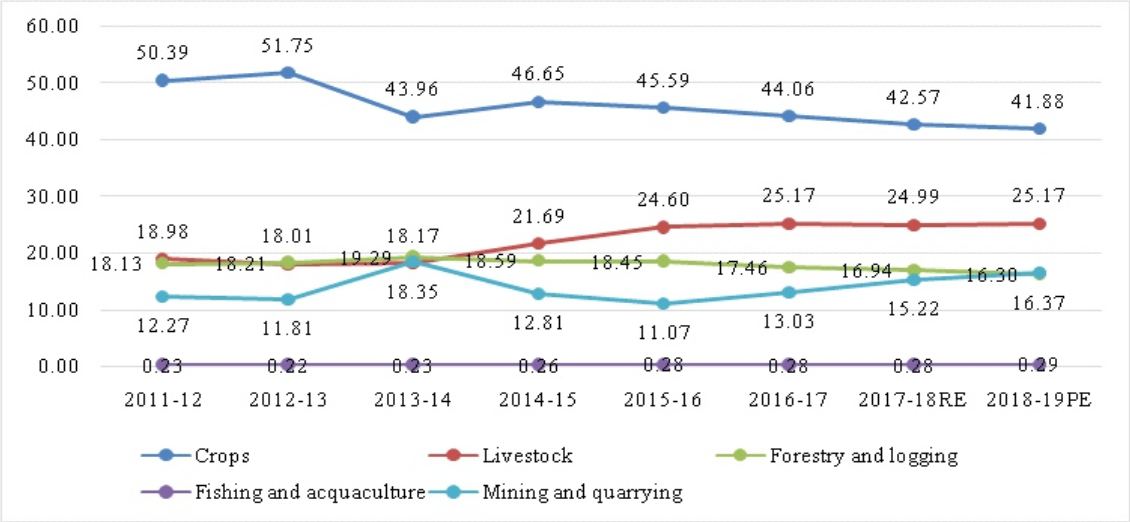


Figure2.8: Different Sector's Contribution in Primary Sector (in %)



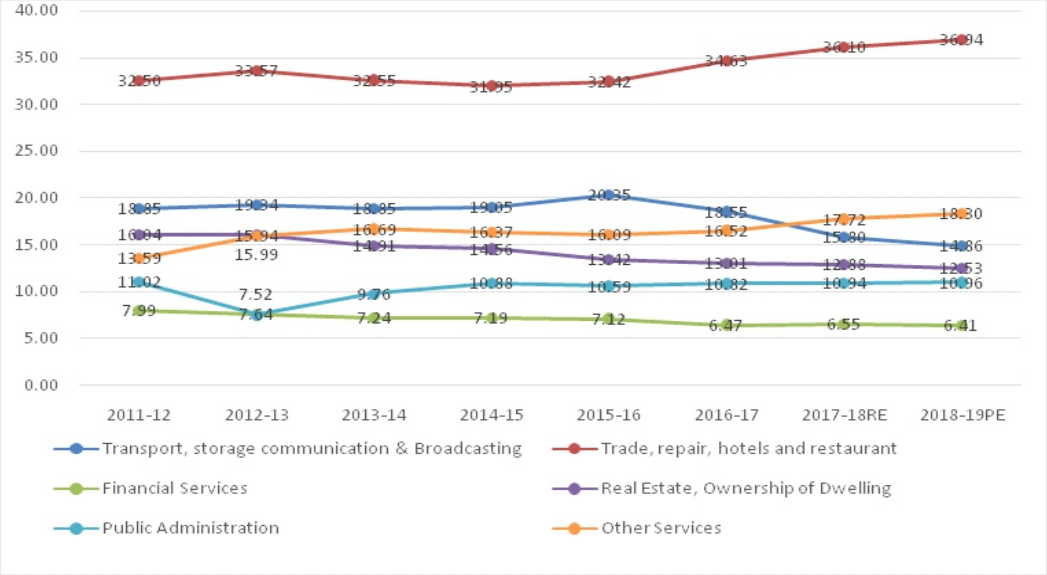
2.2.3 Dynamics of Sectoral Contributions within Primary Sector:

The share of Primary Sector to GSDP has been reducing though agriculture and allied sectors continue to be the main occupation of 70% of rural masses in the State. Agriculture in Uttarakhand is primarily dominated by crop production; however, the contribution of crop production is steadily declining. Even though there is a substantial policy impetus being given for horticulture, it is not sufficient yet to offset the overall declining trend in crop production. Livestock production has shown a steady contribution with substantial growth. However, the livestock growth rate is not that high, such that, it can arrest the overall decline in agriculture. Apart from agriculture and allied sectors, other main contributors to Primary sector are mining and quarrying. This sector has shown a steady increase in last few years and in FY 2018-19, this sector has contributed, approximately 16 % of the Primary sector.

2.2.4 Dynamics of Sectoral Composition within the Tertiary Sector:

The contribution of Tertiary sector in the output of the economy is continuously increasing in last few years. The major driver for this growth is expansion of trade, hotels and restaurants, resulting from expansion of tourism industry. Also, particularly, trade is expected to grow as the roads network and means of communications improves. Further, trade has strong complementar -ity with the manufacturing sector. This sector, trade, hotels and restaurant, in the year 2018-19 contributed 36.94 % of the Tertiary sector. The other Tertiary sub sectors were growing as per the total output growth of the economy. The other major Tertiary sectors are transport, storage, communication & broadcasting, real estate, ownership of dwellings and other services.

Figure2.9: Sectoral Composition of the Tertiary Sector



2.3 Gross Fixed Capital Formation:

2.3.1 Gross Fixed Capital Formation in Public Sector

Capital formation plays a vital role in growth of an economy. It plays multiple roles of creating capacity to produce output, increase the productivity of the economy and create demand in the economy. Further, if it is coupled with new knowledge, innovations etc., the competiveness of the economy will go up. Gross Capital Formation that is calculated at the national level broadly comprises of public sector, private sector, household sector and valuables. *However at the State level, Uttarakhand has estimated and published data on gross fixed capital formation of public sector only,* which has been further divided into four asset categories; namely building sector, machinery and equipment, cultivable biological resources and intellectual property products for the period 2011-12 to 2016-17.

The table below shows Gross Fixed Capital Formation for the public sector in Uttarakhand. *So there is a limitation of data to understand the overall picture of capital formation.* However to understand the growth potential of the State, given the sectoral structure of the economy, it is crucial to have regular data on capital formation by the State Govt., capital formation in the manufacturing sector (for this the data from Annual Survey of Industries, the NSSO survey of unorganised manufacturing sector may be used) and capital formation in the trade, restaurant and hotels (the data from NSSO survey on un-incorporated enterprises may be used). Further, we need a reasonable estimate on the rate of depreciation for these three sectors to understand the estimated capital that iscurrently in use. Due to this difficulty, we are restricting ourselves on the data that is available with us, which is published by the DES, Govt. of Uttarakhand.

Table 2.1 Gross Fixed Capital Formation (GFCF) by Public Sector

	Public Sector GFCF		GFCF by Central Govt.		GFCF by State Govt.		Contribution of Central Govt.	Contribution of State Govt.
	Amount (Rs. Cr.)	Growth Rate (%)	Amount (Rs. Cr.)	Growth Rate (%)	Amount (Rs. Cr.)	Growth Rate (%)		
2011-12	6046		3648		2398		60.33	39.67
2012-13	6851	13.31	3363	-7.81	3488	45.45	49.09	50.91
2013-14	8798	28.42	4451	32.35	4347	24.63	50.59	49.41
2014-15	10862	23.46	3969	-10.83	6892	58.55	36.54	63.46
2015-16	12150	11.86	5357	34.97	6793	-1.44	44.09	55.91
2016-17	14585	20.04	6075	13.40	8510	25.28	41.65	58.35
2017-18[F]	15948	9.35	6241	2.73	9707	14.07	39.13	60.87
2018-19[F]	17681	10.87	6745	8.08	10936	12.66	38.15	61.85
2019-20[F]	19414	9.80	7248	7.46	12165	11.24	37.34	62.66

Table 2.1 reveals that GFCF(public sector) increased from ₹6,046 crores in 2011-12 to ₹14,585 crores in 2016-17(PE) and accordingtothe forecast, its value is to further increase to ₹19,414 crores in 2019-20. To begin with, in FY 2011-12, the Central Govt's units and department's had a very major role in the capital formation of the State. In subsequent years, the State Government has done a rapid capital formation and that has resulted in overall rapid growth of capital formation by the Government sector, which is much higher than the GDP growth rate of the State. However, we also need to remember that the Government had to undertake massive re-construction exercise subsequent to 2013, when the natural calamity of Kedarnath happened.

The Central and State share in the public sector GFCF was 60.33% and 39.67% respectively in 2011-12. However, in 2016-17, Centre's share has significantly declined to 41.65% and the State's increased to 58.35%. This trend is likely to continue for the forecasted period and is estimated to reach 37.34% Centre share and 62.66% State share in 2019-20. It is a healthy signal for the State that its contribution to public sector GFCF is increas in govertime.

Nevertheless, a countrywide lockdown imposed till mid of April to counter the impact of the deadly Coronavirus slated to dampen the building sector, machinery and equipment asset categories and so is likely to negatively impact the GFCF.

2.3.2 Sectoral Dynamics in Gross Fixed Capital Formation (GFCF) by Public Sector:

Table 2.2 Sectoral Share and Growth in GFCF by Public Sector

	Primary Sector GFCF		Secondary Sector GFCF		Tertiary Sector GFCF	
	Share in total (%)	Growth Rate (%)	Share in total (%)	Growth Rate (%)	Share in total (%)	Growth Rate (%)
2011-12	12.89		57.39		29.72	
2012-13	10.45	-8.09	59.99	18.44	29.56	12.69
2013-14	10.71	31.56	53.53	14.60	35.76	55.41
2014-15	10.71	23.46	50.94	17.47	38.34	32.35
2015-16	12.69	32.59	45.72	0.40	41.60	21.34
2016-17	11.21	6.10	46.23	21.37	42.56	22.81
2017-18^{F}	11.46	11.74	44.97	6.38	43.57	11.94
2018-19^{F}	11.47	10.92	44.04	8.58	44.49	13.23
2019-20^{F}	11.47	9.84	43.27	7.88	45.25	11.67
Avg, between 2011 -12 to 2016-17		17.12		14.46		28.92

Though the GFCF in all the three sectors - the Primary, Secondary and Tertiary Sectors GFCF of the State is increasing during the period 2011-12 to 2019-20. In proportionate terms, the share of Primary Sector in the public sector GFCF has declined from12.89% (2011-12) to 11.21% in (2016-17) and to 11.47% for 2019-20 (forecasted value). The share of Secondary Sector has also declined from 57.39% in 2011-12 to 46.23% in 2016-17. However, the Tertiary Sector has gained. The share for the Tertiary sector has gone up from 29.72% in 2011-12 to 42.56% in 2016-17. With all these three sectors and especially the secondary and tertiary sectors being badly hit by Covid-19 the growth of GFCF is likely to go down in the year 2020-2021.If we look at the average growth rate of capital formation, during this period, the Secondary Sector has lowest growth in GFCF, whereas the Tertiary Sector has the highest growth rate in GFCF. Generally, capital formation impact the output with some years of lag. This lowering growth of capital formation in the Secondary Sector may have a influence on lowering share of Secondary Sector in the State's output in comparison with the Tertiary Sector in current years. The reason for lowering capital formation in the Secondary Sector comes out clearly from the institutional composition of capital formation. From the year 2011-12 to 2016-17, on average more than two-thirds of capital formation by the

State Government was by the State Public Administration. The capital formation by the non-departmental enterprises on average was 12.41%. For the Central Government, the nondepart-mental enterprises, constituted more than 65% of the GFCF in 2011-12. But in subsequent years, the share of non-departmental enterprises has come down. All these point out that capital formation by non-departmental enterprises or PSUs of the Central Government has grown at a slower rate. And this may be the reason for low growth of capital formation in the Secondary Sector of the State by the public sector. This very institutional composition of capital formation may also be reason for dominance (more than 70%) of Dwellings, Other Buildings Structures in asset profile of capital formation. However, despite this heavy investment in construction sector by the Government, the contribution of the construction sector in GDP is not going up. This essentially indicates that the participation of private capital in the construction sector is not very encouraging.

Capital formation plays a vital role in the development of an economy and is considered as anindicator of economic development of any State or nation. Estimates of capital formation arerequired to take decision about the balanced development of the State economy. Gross Capital Formation is calculated at the national level broadly comprises of public sector, private sector, household sector and valuables, Uttarakhand Government has estimated and published data ongross fixed capital formation of public sector. It is, broadly divided into 4 assets categories - buildings and other building sector, machinery and equipment, cultivable biological resources and intellectual property products for the period 2011-12 to 2016-17.

Hence, other than public sector components, components like private sector, household sector and valuables are excluded in the GFCF estimates of the State. It presents an incompletepicture of State's gross fixed capital formation. Directorate of Economics and Statistics mayconsider collecting data on other components so that the actual position of GFCF can bestudied at the State level.

A better incentive structure may be created to foster growth in urban infrastructure in major cities of the state with greater participation of private capital.

Further, to get rid of recent sluggishness in the Secondary Sector, the capital formation by the State Government may increase focus on creating infrastructure like energy, roads etc. In energy, there should be greater focus on renewable energy like solar and wind energy and creation of small hydel projects. However, all these need to be given grid connection. It is technologically now possible.

2.4 Banking Sector:

Banking facilities are extremely important for resource mobilization, development activities and financial inclusion. There were 2,359 branches of all categories of banks in the State as on 30 September 2019. Of these, maximum branches are of public sector banks numbering 1469 followed by the private banks- 314. Number of branches of Cooperative Banks and Regional Rural Banks are 289 and 287 respectively. There is a bank branch for every 4,290 people of the State as per census 2011.

Table 2.6 shows all key indicators of State banks' performance. Total advances of banks increased during 2017 to 2019 while the credit to deposit ratio showing a steady increase from 2017 onwards. Share of priority sector advances in total advances has shown a decreasing trend from 2017 onwards. Furthermore, share of agricultural advances in total advances has also shown a decreasing trend from 2017 onwards. These trends show that the unorganized sector in the Stateis not doing very well from 2017 onwards. Either, there is less demand for credit or banks has become more conservative to advance loans to this sector. Covid – 19 will further worsen the state of unorganised sector as it has badly hit this sector and many of the people from these sectors lost their jobs and some others are not doing well in their businesses. Such situation will decrease the credit demand by the unorganised sector as their repaying capacity have become very less. The situation will further lead to decrease in priority sector advances and will also disturb the credit to deposit ratio.

In 2018-19, banks could achieve 84% of annual credit plan. It has provided 70 % of its targeted Crop loans and to over-all farm sector, it could provide 67% only. However, in non-farm sector, banks have provided more loans than the target. In other priority sectors, they have fulfilled 91% of the target.

Table 2.3 : Key Indicators: All Scheduled Commercial Banks Including RRBs in Uttarakhand State as On September 2019 (₹In Crores)

Sr. No.	PART ICULARS	AsOn March 2017	AsOn March 2018	AsOn March 2019	AsOn Sept 2019	RBIB. Marks
1	Deposits	109263	116457	129251	136335	
	PercentageOf Growth DuringThe Year	19.46	6.58	10.98		
2	Advances Including Investment	61780	64769	75465	72866	
3	Total Advances	60551	66740	77242	77913	
	PercentageGrowth During The Year	11.79	10.22	15.73		
4	Credit+ Investment To Deposit Ratio	56.54	55.62	58.39	53.45	
	Credit-Deposit. Ratio,Whole State	55.42	57.31	59.76	57.58	**60%**
	Credit-Deposit. Ratio, Rural	58.00	69.00	68.00	62.00	
	Credit-Deposit. Ratio, Semi-Urban	53.00	50.00	55.00	54.00	
	Credit-Deposit. Ratio, Urban	55.00	54.00	57.00	56.00	
5	Priority Sector Advances (PSA)	28600	30826	35168	32828	
	Share Of PSA InTotal Advances(Percentage)	62.73	59.95	58.91	54.89	
6	AgricultureAdvances	10968	11081	11316	10515	
	Share Of AgricultureAdv. InTotalAdv (Percentage)	24.06	21.55	18.96	17.58	
7	MicroandSmallEnterprises(MSE) Adv.	11691	12618	16304	15845	**40%**
	Share Of MSE Adv. In Total Adv (Percentage)	25.64	24.54	27.31	26.49	
8	Advances To WeakerSection	8767	9310	9077	7358	**18%**
	Share Of Weaker Section Adv.in Total Adv. (%age)	19.23	18.10	15.21	12.30	
9	Dir Advances	78.15	82.36	18.19	19.41	
	Share Of DRI Adv. InTotalAdv. (Percentage)	0.17	0.16	0.03	0.03	
10	Advances To Women	2742	3348	4421	4608	**10%**
	Share Of Women Adv. InTotalAdv. (Percentage)	6.01	6.51	7.41	7.71	
11	Advances ToMinorities	7128	4917	5635	5734	**1%**
	Share Of Minorities Adv.In Total Adv.(Percentage)	15.63	9.56	9.44	9.57	
12	No. of Branches(In Nos.)	2269	2305	2351	2359	
	No. of Rural Branches	1116	1127	1133	1138	
	B. No. of Semi Urban Branches	654	606	609	604	
	No. of Urban/Metro Branches	**499**	**572**	**609**	**617**	

Source:71st SLBC BOOK

The Macroeconomic Strategy

The macroeconomic strategy by a State government essentially moves around the application of fiscal instruments, as the financial sector is primarily in the hands of the banking sector. Typically, a State Government faces difficulty in mobilizing more resources and spending it fast and efficiently. However, these issues do not come under the limited scope of this chapter. In this chapter, we have already identified that ensuring growth, particularly in industries and agriculture is the key issue that the economy is facing on the macroeconomic front. Nevertheless, continued spread of the pandemic and its aftermath have significantly slowed down both the sectors and especially business industries, hence financial institutions will have to take additional measures to ensure business continuity to continue and to remain relevant to their customers. Banks and financial institutions will have to prepare for scenarios that might occur post the lockdown period as well. This would be essential in developing a flexible contingency plan that best equips the banks for crisis management and provides supportive solutions to its customers. And the challenge is to strategize how the Govt. can utilize its limited resources to address both the issues.

The State Govt. has correctly decided to promote a shift from cereal production to cash crops, including horticulture, medicinal aromatic plants, floriculture and dairying. However, this requires adequate infrastructure related to agri-business. One approach may be to integrate and strengthen the infrastructure required for both tourism and agri-businesses. Agri-businesses themselves can be linked with eco-tourism, hence creating the economies of scope both in agri-business and tourism sector. This approach has the potential to revive the hill economy and hill agriculture.Good examples are resorts in Sikkim located within orchid gardens, lavender fields in England, which offer destination tours with catering facilties and restaurants located in garden nurseries, vinyards in Nashik offering boarding and lodging to tourists. In view of the covid 19, reviving tourism will require special measures to be taken forth. The main strategies those can be adopted for tourism revival is given in Traformational Tourism Chapter.

Uttarakhand is one of the most industrial States (as a contribution to GDP) within the country, though overall size of the industry is not very big. State had been successful to attract big manufacturing business houses through the tax exemption scheme of Central Government. However, due to lack of human capital development and enabling ecosystem for such development(Niti Aayog Report 2018 - Report of Working Group IV Strengthening Skill and Entrepreneurship Landscape in Indian Himalayan Region) and lack of entrepreneurship culture within the State (Impact of Family Capital & Social Capital on Youth Entrepreneurship - Sharma 2014, A Study of Uttarakhand State, India: Journal of Global Entrepreneurship Research), small and medium scale industries that generally get developed around the big industries, have not developed to their optimal potential.

If lack of entrepreneurship in the State is to change, the State has to step in to promote entrepreneurship culture and such behavioural change has to begin early in life of our youth starting from class 8. At the same time, government schemes should support entrepreneurs in all spheres of life touching all sectors and sub sectors.

As the tax exemption regime has been changed due to implementation of GST, it is a challenge to keep these big industries within the State. Further, as there is slowdown in manufacturing sector at the national level, many of the big industries are utilizing this period for restructuring the workforce such that they can adopt newer technologies. Given this scenario, the State needs to create alternative strategies of creating competitive advantage. However, in the absence of large domestic market or reserves of raw material, the State faces a challenge in maintaining competitiveness in attracting newer industries. The problem has further been aggravated by Covid 19 and its severe impacts on manufacturing sector. This has affected both turnover and sales of the products. To boosts the manufacturing sector, joint efforts will be required from government and private sectors engaged in manufacturing. Both will need to sit together to adopt the cost cutting strategy that does not affect the employees, higher revenue and new product strategies.

Some of these challenges can be partially addressed with improvement in the supply of skilled workforce at competitive rates, development of local entrepreneurship, ensuring availability of cheap and abundant electricity based on more renewable energy. To make the workforce more skilled and develop the culture of entrepreneurship requires investment in human capital development. There should be proper identification of skill gaps and adequate emphasis on the cultural aspects of entrepreneurship. Apart from hydro-electricity, a much greater emphasis is needed on generating electricity from solar and small hydel projects and integrate them with the electricity grid augment its availability for distribution.

CHAPTER 3
A Review of Fiscal Developments

"The difficulty lies not so much in developing new ideas as in escaping from old ones"

-John Maynard Keynes

Abstract

Uttarakhand is the fifth State in the country, to pass the State GST Bill, after Telangana, Bihar, Rajasthan and Jharkhand. The State faces three challenges in the GST regime. The first challenge is realising the targets of GST collections. The State needs to make policy interventions to increase compliance and enhance the administrative mechanism to detect tax evasion. While the State has achieved significant progress on the front of GST filings, which nearly equal the national average, further improvement is possible by laying more emphasis on taxpayer education and pulling up the defaulters. Another pertinent aspect that needs to be taken into consideration in this context is to take care to avoid making any unrealistic revenue forecasts in the budget estimates. In fact doing so, will lead to a situation, where the State may have to cut down its expenditure, even for its more productive heads. The second challenge is the dependence of the State on Compensation from Central Government to meet the revenue short fall due to implementation of GST. It is worth considering the idea of re-calibrating to the new reality of the existing indirect tax regime in the country and trek the path of transformation, where the State's economy would be more services driven, which in turn could generate a sustainable base for GST collections. The third challenge is the slowing economy and reviving growth, which requires correct diagnosis to understand whether it is due to cyclical or structural reasons.

On fiscal front, the fiscal deficit rose to 3.78 % of GSDP in 2018-19 from 3.45% in 2017-18. It is expected to grow further due to the loss of government revenues in face of the COVID induced extended lockdowns. Given the fiscal commitments of the State and an impeding economic slowdown, a rise in the fiscal deficit is a major challenge and it needs to be tackled with utmost caution and urgency. Policies aimed at improving tax collections and measures to cut down revenue expenditure by bringing in operational efficiencies in the functioning of the State Departments would go a long way in bringing down the fiscal deficit. While reducing fiscal deficit is important for State's fiscal health, equally important is to improve the quality of fiscal deficit. It may be kept in mind that efforts to ensure a reduction in fiscal deficit, should not lead to a reduction in spending on key social and economic services.

The State's Total Tax Revenue (TTR) has witnessed an increasing trend as the collections rose from ₹ 1393.23 crores in 2002-03 to ₹ 20199.68 crores in 2018-19. Uttarakhand's Own Tax Revenue (OTR) has been growing in absolute terms between 2002-03 and 2018-19. The State's OTR jumped from ₹1079.11 crores during 2002-03 to ₹12188.09 crore in 2018-19. The State excise as a percentage of own tax revenue declined to 14.21% in 2018-19, from 22.25% in 2017-18, which needs immediate attention and redressal, in order to reverse the trend. Stamps and Registration Fees as a percentage of OTR fell sharply to 5.02 % of the OTR in 2018-19, from 8.68 %. In 2017-18, which is in fact the lowest since the inception of the State.

On the front of State's sharing of taxes with the Centre, Uttarakhand is one among the 13 States that received revenue deficit grants for the FY 2020-2021 from the 15th Finance Commission. The State received a revenue deficit grant of Rs. 5,076 crore. It also received Rs. 574 crore grants to rural local bodies, which constitutes 0.95% share in the total grants made to rural local bodies, and received Rs. 278 crore as grants to urban local bodies, which is also 0.95% of the total grants made to urban local bodies.

3.1 Introduction:

Fiscal policy plays an important role in a State's economy. Given its importance, the present chapter attempts to touch upon various facets of fiscal policy ranging from tax collections to expenditure and revenue sharing with the Centre. It is divided into three sections. The First section makes an attempt to bring together the activities and achievements of the State and also discusses the challenges and the way ahead with respect to implementation of GST in the State. The second section makes an attempt to analyse the trends of non-GST revenue growth dynamics of the State. This section also makes an attempt to analyse the fiscal indicators of the State and discusses the challenges and suggests the way ahead. The third section attempts to make a comparison of central grants with other States, particularly Himachal Pradesh. It discusses about the devolution criteria under of the 15th Finance Commission and attempts to compare the share of the States in the Centre's taxes under 15th Finance Commission, with that of 14th Finance Commission. In addition to this, it also discusses grants made to rural and urban local bodies under 15th Finance Commission.

Section-I

3.1.1 Uttarakhand's Tryst with GST Achievements, Challenges & the Way Ahead

With the roll out of GST from 1 July 2017, a number of State taxes have been subsumed under GST. They include central sales tax, State VAT, purchase tax, luxury tax, entry tax (all forms), entertainment tax (not levied by local governments), tax on advertisements, taxes on lotteries, betting and gambling and State surcharges and cesses so far as they relate to supply of goods and services. Uttarakhand is the fifth State in the country, to pass the State GST Bill, after Telangana, Bihar, Rajasthan and Jharkhand. Analysing the State's experience with GST since its introduction would help understand the shortcomings and areas with scope for improvement, which could be helpful in further policy making.

3.1.2 Registration:

During the period between 01 July 2017 and December 2019, a total of 98,676 dealers were registered, whereas 69,898 registered dealers migrated from VAT into the new system. Thus up to 31st December 2019 total number of registered dealers in the State reached 1, 68,570

Table No.3.1: Number of Businessmen Registered in GST

Number of Businessmen Registered Under GST (Data as of 31th December, 2019)		
Sr.	**Dealers**	**Number**
1	Number of Migrated Taxpayer	69,898
2	New Registration (State)	41,443
3	New Registration (Centre)	57,233
4	Total Taxpayer	**1,68,574**
5	Composition Dealer (State)	22,678
6	Composition Dealer (Centre)	10,697
7	Total Composition Dealer	**33,375**

Source: Department of Economics and Statistics, GoUK

3.1.3 GST Mitra:

Uttarakhand is a mountainous State having tough terrains. Due to this peculiarity, approaching people and creating awareness among small taxpayers of the State is an arduous task. For overcoming this problem a unique concept of GST Mitra has been devised and so far 1434 GST Mitras have been trained.

3.1.4 Dealer Insurance Scheme:

In the general interest of dealers, an insurance scheme has been made applicable for a period of one year beginning from 19.11.2019 to 18.11. 2020. The scheme covers all the dealers registered with the State tax Department and in case of death of any registered dealer, a claim of ₹ 5 Lakhs will be provided immediately.

3.1.5 24X7 Help Desk Service:

A 24X7 help desk service is established at the State Tax headquarters as well as in the State Tax offices at Haridwar and Rudrapur for redressal of any difficulty with regard to the provisions of GST, especially regarding the preparation of e-way bills.

3.1.6 Collection:

During the financial year 2019-20, up to December 2019, the State's tax Department had collected a tax of Rs.11755.67 crore (CGST+IGST+SGST+CESS). However this is 3.6 percent lesser than the tax of Rs.12196.87 crore collected for the same period in financial year 2018-19.Details of Tax Collection are provided in **Table 3.2**

Table No.3.2:Details of the Tax Collection by Uttarakhand State Tax Department

Details of the Tax Collectionby Uttarakhand State Tax Department (Amount in Crores of Rs)																
	2018-19								2019-20							
Month	CSGT	IGST	SGST				CESS	Total (2+3+7+8)	CGST	IGST	SGST				CESS	Total (10+11+15+16)
			SGST	IGST Settlement	Advance Apportionment from IGST	Total SGST (4+5+6)					SGST	IGST Settlement	Advance Apportionment from IGST	Total SGST (12+13+14)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
April	211.54	924.77	355.89	-10.39	0.00	345.5	22.56	1504.37	218.80	1004.96	369.64	71.36	74.44	515.44	23.89	1763.09
May	160.38	761.51	303.99	-5.51	0.00	298.48	20.83	1241.2	192.42	694.98	345.22	92.1	0.00	437.32	15.09	1339.81
June	164.16	770.71	309.87	17.00	310.00	636.87	21.27	1593.01	191.21	669.50	350.15	75.33	0.00	425.48	20.75	1306.94
July	179.41	889.7	321.93	3.59	0.00	325.52	17.07	1411.7	194.08	736.23	339.75	109.8	92.96	542.51	18.84	1491.66
August	158.9	549.46	297.24	0.10	74.00	371.34	14.57	1094.27	187.71	423.05	316.23	55.81	0.00	372.04	14.10	996.90
Sept	157.81	779.54	289.72	20.51	0.00	310.23	19.53	1267.11	185.89	533.98	286.29	105.79	0.00	392.08	10.48	1122.43
Oct	179.39	868.64	341.43	5.88	186.12	533.43	21.38	1602.84	204.31	620.92	316.07	-30.45	0.00	285.62	12.03	1122.88
Nov	167.82	616.85	339.53	66.85	0.00	406.38	23.36	1214.41	228.97	680.44	356.18	76.19	0.00	432.37	14.61	1356.39
Dec	154.25	591.46	292.68	101.06	111.67	505.41	16.84	1267.96	230.01	638.86	330.15	42.46	0.00	372.61	14.09	1255.57
Total	**1533.66**	**6752.64**	**2852.28**	**199.09**	**681.79**	**3733.16**	**177.41**	**12196.87**	**1833.4**	**6002.92**	**3009.68**	**598.39**	**167.4**	**3775.47**	**143.88**	**11755.67**

Source: Department of Economics and Statistics, Government of Uttarakhand

3.1.7 Revenue Projections for Future:
The impact of the Goods and Services Tax on the State's own tax revenues will be largely dependent on the revenue buoyancy of the GST. However, for five years the Union Government has guaranteed all State governments compensation equivalent to 14% annual growth in revenues. In this context, the details of the assured revenue and the revenue projections for the forthcoming years are mentioned in Table 3.3.

Table No.3.3:Assured Revenue & Revenue Projections for Forth coming Years (Rs.in Crores)

S.N.	Financial year	Assured Revenue (Under GST)	Projected GST (without compensation)	Projected Non-GST	Total Projected Tax	Projected Growth If GST was not implemented
	2	3	4	5	6 (3 + 5)	7
1.	2019-20	8,379	4593	2096	10,475(3+5)	12401
2.	2020-21	9,552	4904	2336	11,888(3+5)	14851
3.	2021-22	10,890	5236	2602	13,492(3+5)	17784
4.	2022-23 (3 months)	3104	1398	725	3,829 (3+5)	
	2022-23 (9 months)		4192	2174	6,366(4+5)	
		3104	**5590**	**2899**	**10,195**	**21296**

Source: Department of Economics and Statistics, Government of Uttarakhand

3.1.8 The Challenges and the Way Ahead: It is a fact that the decision to roll out the Goods and Services Tax (GST) was a historic one. Indeed it has the potential to bring in qualitative change in the tax regime of the country. However the benefits of the new system would flow in, once the nation adjusts to it and the State get stabilized. In the meantime, the State has to confront three challenges.

1. Realizing the Targets of GST Collections: 1. Trek the Right Path

The first challenge is to realize the targeted GST collections. To address this challenge, the State needs to make policy interventions to increase compliance and enhance the administrative mechanisms to detect tax evasion. While the State had achieved significant progress on the front of GST filings, which are nearly equal to the national average, laying more emphasis on taxpayer education and pulling up the defaulters could further improve it. In addition to this, endeavours to expand the tax net and improved supervision of e-way bills would go long way in realizing higher GST collection.

Another pertinent aspect that requires consideration in this context is, take enough care to avoid making any unrealistic revenue forecasts in the budget estimates. Any framework that will be adapted for the projections of tax revenues needs to consider the macro economic realities at the ground level into account. In fact doing so, will lead to a situation, where the State may have to cut down its expenditure, even for its more productive heads. The same has been reiterated by the RBI Study of State Budgets 2019-2020.

2. Dependence on Compensation from Central Government: Transformation Needed:

It is an undeniable fact that Uttarakhand has been at a competitive disadvantage, being a manufacturing State, unlike its counterparts in the Himalayan region. In order to compensate the revenue loss of the State, due to its shift to the new tax regime, the Union Government assured to provide compensation for five years from the date of implementation of GST. However, it cannot be a permanent solution and the State cannot afford to depend upon the Centre's assistance for long. The major challenge for the State is to preparefor the period after the completion of this five-year's assured compensation.

Hence it is worth considering the idea of re-calibrating to the new reality of the existing indirect tax regime in the country and trek the path of transformation, where the economy would be more services driven, which in turncould generate a sustainable base for GST collections. However the reality suggests otherwise. For instance the sectoral composition of GSDP in Uttarakhand's economy is dominated by the Secondary Sector, which contributed 48.93% to the GSDP while the Tertiary Sector in FY 2018-19 contributed 40.51% to the State's GDP. A change in this trend of Secondary Sector's dominance in favor of Tertiary Sector needs a structural transformation, which may be gradual but sustainable in nature, over a period of time. *In order to achieve this structural transformation, the State needs to envisage policies with a three dimensional approach. The three dimensions of structural change include - final demand, the inter-industry division of labour and inter-industry productivity differences. If the policies of the State could induce these dimensions in favour of the services sector, Uttarakhand has the potential to witness structural change from secondary sector dominance to services sector growth.*

3. A Slowing Economy- Reviving Growth- Some Questions

Following the national trend, the State's economy is witnessing a slowdown in its growth rates. The NSDP that was growing at the rate of 8.93% in 2016-17, slowed to 6.45% in 2017-18 and further dipped to 5.4% in 2018-19. Similarly, the GSDP that was growing at the rate of 9.83% in 2016-17 slowed to 7.84 % in 2017-18 and further dipped to 6.87% in 2018-19. As the economy slows down, it is apparent that the tax revenues fall, reducing the fiscal space for the State.

While it is simple to state that reviving the economy is the key to improve tax collections, the very revival of economic growth in itself is a complicated proposition. In fact it creates

more questions than answers. Thus instead of posing a readymade solution to address the slowdown in the State's economic growth, it is pertinent to raise questions that attempt to find the nature of the slowdown and causes of it. This would help diagnose the exact problem and draw policy implications. The first question one needs to put is, whether the current slowdown in the economy is part of the business cycle or is it due to any structural imbalance in the economy. In case the slowdown is due to structural imbalances then the State needs to address them through structural reforms aimed at addressing them.

If the slowdown is part and parcel of the business cycle, then the second question arises, whether it is due to fall in demand for goods and services or due to the build up of excess capacities. If the slowdown is due to a fall in demand, the State needs to take fiscal measures that aim at increased Government spending, albeit at the cost of increased fiscal deficit. This would create more demand and the fiscal situation can be improved, with the increased tax collections once the economy revives. In case the slowdown is due to accumulation of excess capacities, it can contemplate the policy of providing fiscal incentives to the enterprises, to boost economic activity, depending upon the fiscal space available. Given the limited scope of this section, it does not dwell upon the details of policy making for reviving growth. However it attempts to underscore the importance of right diagnosis for the current slowdown, which is an urgent need.

Table No.3.4:Total Tax Revenues (TTR), OTR and Non-GST OTR of Uttarakhand

Year	Total Tax Revenue (TTR)	Own Tax Revenue (OTR)	OTR as % of TTR	Major Non-GST Revenues			
				State Excise	State Excise % OTR	Stamps and Registration Fees	Stamps and Registration Fees % OTR
2002-2003	1393.23	1079.11	77.45	245.86	24.12	123.35	12.10
2003-2004	1660.99	1227.76	73.92	273.37	22.27	168.94	13.76
2004-2005	1964.32	1444.34	73.53	292.01	20.22	207.80	14.39
2005-2006	2794.51	1784.68	63.86	292.75	16.40	333.39	18.68
2006-2007	3645.61	2513.78	68.95	372.91	14.83	546.32	21.73
2007-2008	4166.45	2738.70	65.73	441.56	16.12	424.27	15.49
2008-2009	4551.50	3044.91	66.90	528.35	17.35	357.46	11.74
2009-2010	5109.05	3559.04	69.66	704.64	19.80	398.70	11.20
2010-2011	6865.55	4405.48	64.17	755.92	17.16	439.50	9.99
2011-2012	8481.66	5615.62	66.21	843.65	15.03	524.05	9.34
2012-2013	9687.13	6414.25	66.22	1117.92	17.43	648.40	10.10
2013-2014	10928.72	7355.34	67.30	1269.29	17.26	686.71	9.34
2014-2015	12130.77	8338.47	68.74	1486.66	17.83	714.06	8.56
2015-2016	14710.98	9377.79	63.75	1735.39	18.50	870.67	9.28
2016-2017	17308.88	10897.31	62.96	1905.54	17.49	777.58	7.12
2017-2018	17249.84	10164.93	58.93	2261.68	22.25	882.26	8.68
2018-2019	20199.68	12188.09	60.33	2871.07	14.21	1015.43	5.02

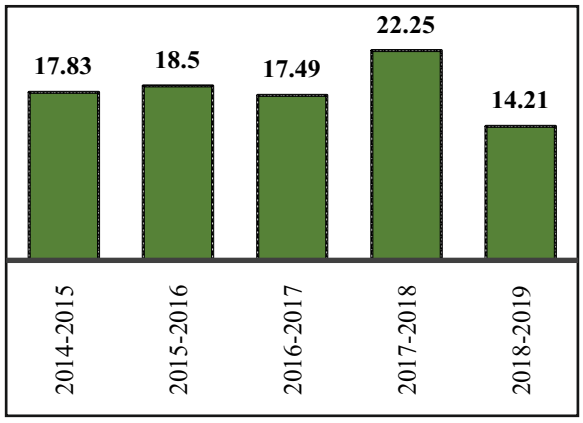
Sources: i) Budget Documents, Government of Uttarakhand; ii) Department of Excise Duty, Government of Uttarakhand iii) Department of Stamps and Registration, Government of Uttarakhand

3.2 Analysis of Non-GST Revenue Growth Dynamics & Fiscal Profile

Section-II

As discussed in the earlier section, there is clarity about the expected GST revenues, since the State Government is assured of 14% revenue growth for 5 years, as far as taxes, which are subsumed under GST, according to GST law. It is in this context there is a need to look at the Non-GST Own Tax Revenue (OTR) growth in the years to come. This section lays emphasis on the growth and magnitude of Non-GST OTR of Uttarakhand. An attempt is made to understand the trend of Non-GST tax revenues in the OTR of Uttarakhand. The details of the total tax revenues (TTR), OTR and Non-GST OTR of Uttarakhand are provided in Table 3.4 Table 3.4 suggests that the State's TTR has witnessed an increasing trend as the collections rose from ₹ 1393.23 crores in 2002-03 to ₹ 20199.68 crores in 2018-19. Uttarakhand's OTR has been growing in absolute terms between 2002-03 and 2018-19. The State's OTR jumped from ₹ 1079.11 crores during 2002-03 to 12188.09 crore in 2018-19. However this growth as a percentage of Total Tax Revenue is not consistent for the same

Fig 3.1: State Excise as a percentage of OTR



period. OTR as a percentage of TTR was 63.75% during 2015-16. It declined to 62.96% during 2016-17 and further dipped to 58.93% 2017-18. It improved during 2018-19 by touching 60.33 %.

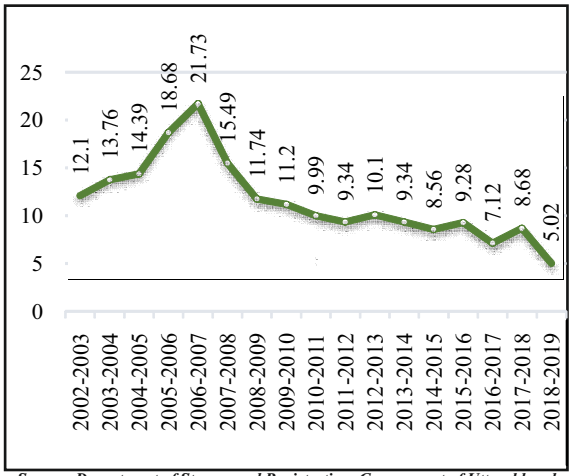
3.2.1 Trends in the Non-GST Revenues:

Major Non-GST Revenues of the State, consisting of State Excise and Stamps and Registration fees have been analysed from 2002 - 03 to 2018-19. Although the revenue from the State excise has gone up from 17.83% of OTR in 2014-15 to 18.50% in 2015-16, it fell to 17.49% in 2016-17. Later, there is an improvement in the State excise as a percentage of OTR, as it increased to 22.25% during 2017-18. However, as suggested by the figure 1, the State excise as a percentage of own tax revenue declined to 14.21 percent in 2018-19, which needs the attention and redressal, in order to reverse the trend.

3.2.2 Stamps and Registration Fees:

Stamps and Registration Fees as a percentage of OTR witnessed an increasing trend from 2002-03 to 2006-07. It rzose from 12.10 % to 21.73% during this period. Except during 2012 - 13 and 2015-16,it registered a declining trend from 2007-08 and continued this trend till 2016-17, to touch 7.12 %. But in 2017-18, the State earned stamps and registration fees of Rs. 882.26 crore and the Stamps and Registration Fees as a percentage of OTR improved to 8.68 %. However it again fell sharply to 5.02 % of the OTR in 2018-19, which is in fact the lowest since the inception of the State, as depicted in the figure 2. In this context, the State could envisage initiatives like setting up of independent evaluation boards for land property, and one-time settlement scheme for settling pending undervaluation, in order to garner more revenue from this source (RBI, September 2019)

Fig 3.2: Stamps and Registration Fees as a percentage of Own Tax Revenue (OTR)



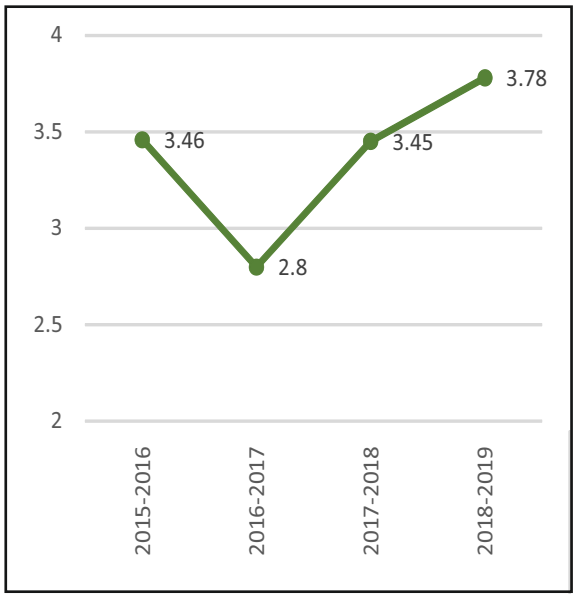
Source: Department of Stamps and Registration, Government of Uttarakhand

3.2.3 Fiscal Indicators of the State: Challenges and the Way Ahead

1. Maintaining the Fiscal Balance:

Fiscal indicators play a vital role in the State's fiscal health. In fact a growing fiscal imbalance has the potential to derail fiscal consolidation and could have serious implications for the overall economic health of the State. The status of State's fiscal deficit is depicted in figure 3.

Fig 3.3: Fiscal Deficit as a percentage of GSDP



Source: Directorate of Budget, Government of Uttarakhand

Figure 3 indicates that the fiscal deficit, which was 3.46 % of GSDP in 2015-16 reduced to 2.8 % in 2016-17. However the fiscal deficit increased to 3.45% in 2017-18 and it further rose to 3.78 % of GSDP in 2018-19. Given the fiscal commitments of the State and an impeding economic slowdown, a rise in the fiscal deficit is a major challenge and it needs to be tackled with utmost caution. Policies aimed at improving tax collections indicated in the earlier section and measures to cut down the revenue expenditure by bringing in operational efficiency in the functioning of the State Departments would go a long way in bringing down the fiscal deficit. There need to be time bound targets for various departments under the State Government, to reduce their operational costs. They may range from reducing the utility costs to adopting management techniques like six sigma, aimed at improvement in the quality of functioning of the departments.

2. Improving the Quality of Fiscal Deficit

While reducing fiscal deficit is important for State's fiscal health, equally important is to improve the quality of fiscal deficit. Revenue expenditure, and capital expenditure are two components of a State's expenditure. While the revenue expenditure is recurring in nature, the capital expenditure helps create infrastructure.

Table No.3.5:Revenue and Capital Expenditure of Uttarakhand (Rs. In crores)

	2015-16	2016-17	2017-18	2018-19
Revenue Expenditure	23086.44	25271.50	29082.65	32196.02
Capital Expenditure	6497.33	10337.94	13642.82	16598.04

Source: Directorate of Budget, Government of Uttarakhand

Table 3.5 suggests that revenue expenditure component is dominating (67% of total expenditure in 2018-19), relative to the capital expenditure part. It increased by 10.7% in 2018-19 as compared to 2017-18. According to a research report titled, 'State of State Finances' by PRS Legislative Research, published in November 2018, States in India had spent 85% of their expenditure on the revenue component, and 15% on capital component. As per the report, 44% of revenue expenditure (this is equivalent to 39% of total expenditure) was spent on committed liabilities, during the period 2011-2019. While Punjab spent the most (63%) on committed liabilities, Uttarakhand stood second at (57%), followed by Kerala (55%), and Himachal Pradesh (54%). Given this trend, policies aimed at improving the quality of fiscal deficit is needed, which is possibly crowding out other developmental expenditure. This could possibly be done by resorting to significant reduction in revenue expenditure.

3. Ensuring the Availability of Sufficient Resources to Meet the Spending Needs of Economic and Social Services:

The third challenge comes in the form of making the necessary financial resources available to meet the developmental needs of the State, while striking a fine balance of quality and quantum of fiscal deficit. In the efforts to ensure a reduction in fiscal deficit, it needs to be ensured that it should not lead to a reduction in spending on key social and economic services. For instance Uttarakhand reduced the allocation to education by 2.8% from 2011-15 to 2015-19 (PRS, 2018). This is only one instance that depicts the possibility of a cut in allocation to important social sectors, to keep fiscal deficit in control.

Section-III

3.3 Comparison of Central Grants

The 15th Finance Commission, chaired by Shri. N. K. Singh submitted its first report, consisting of recommendations for the financial year 2020-21, and it was tabled in the Parliament on February 1, 2020. The final report with recommendations for the period is expected to be submitted by October 30, 2020. The 15th Finance Commissionrecommended decreasing the share of States in the Centre's taxes from 42% during the 2015-20 period to 41% for 2020-21. This 1% decrease is to provide for the newly formed union territories of Jammu and Kashmir, and Ladakh from the resources of the Central government.

3.3.1 Devolution Criteria:

The commission adapted the following criteria for the devolution, for the period 2020-21. In order to decide the share of respective States in the Central taxes, a weight has been assigned to each criterion reflected in in Table 3.6

Table No.3.6:Criteria & Weights Assigned for Horizontal Devolution (2020-21)

Criteria	Weight Percentage
Population	15.0
Area	15.0
Forest and Ecology	10.0
Income Distance	45.0
Demographic Performance	12.5
Tax Effort	2.5
Total	**100**

Sources: Report for the year 2020-21, 15th Finance Commission.

In the criteria mentioned in Table 3.6, highest weightage has been given to income distance. It is basically, the distance of the State's income from the State with the highest income. On the other hand, equal weightage has been given to population and area, while the forest and ecology and demographic performance have been given the weight percentage of 10.0 and 12.5 respectively. The least weight percentage of 2.5 has been given to tax effort. It is in fact the ratio of the average per capita own tax revenue and the average per capita State GDP during the three-year period between 2014-15 and 2016-17. States with higher tax collection efficiency gets rewarded under this criterion. Based on the above criteria, devolution has been made by the Commission to different States. The details of the share of the States in the Centre's taxes and under 15th Finance Commission and its comparison with the same under 14th Finance Commission are provided in Table 3.7.

Table No.3.7:Share of States in the Centre's Taxes

State	14th Finance Commission		15th Finance Commission		Devolution For FY 2020-2021 (In Rs Crore)
	Share Out Of 42%	Share In Divisible Pool	Share Out Of 41%	Share In Divisible Pool	
Andhra Pradesh	1.81	4.31	1.69	4.11	35,156
Arunachal Pradesh	0.58	1.38	0.72	1.76	15,051
Assam	1.39	3.31	1.28	3.13	26,776
Bihar	4.06	9.67	4.13	10.06	86,039
Chhattisgarh	1.29	3.07	1.4	3.42	29,230
Goa	0.16	0.38	0.16	0.39	3,301
Gujarat	1.3	3.1	1.39	3.4	29,059
Haryana	0.46	1.1	0.44	1.08	9,253
Himachal Pradesh	0.3	0.71	0.33	0.8	6,833
J&K	0.78	1.86	-	-	-
Jharkhand	1.32	3.14	1.36	3.31	28,332
Karnataka	1.98	4.71	1.49	3.65	31,180
Kerala	1.05	2.5	0.8	1.94	16,616
Madhya Pradesh	3.17	7.55	3.23	7.89	67,439
Maharashtra	2.32	5.52	2.52	6.14	52,465
Manipur	0.26	0.62	0.29	0.72	6,140
Meghalaya	0.27	0.64	0.31	0.77	6,542
Mizoram	0.19	0.45	0.21	0.51	4,327
Nagaland	0.21	0.5	0.23	0.57	4,900
Odisha	1.95	4.64	1.9	4.63	39,586
Punjab	0.66	1.57	0.73	1.79	15,291
Rajasthan	2.31	5.5	2.45	5.98	51,131
Sikkim	0.15	0.36	0.16	0.39	3,318
Tamil Nadu	1.69	4.02	1.72	4.19	35,823
Telangana	1.02	2.43	0.87	2.13	18,241
Tripura	0.27	0.64	0.29	0.71	6,063
Uttar Pradesh	7.54	17.95	7.35	17.93	1,53,342
Uttarakhand	0.44	1.05	0.45	1.1	9,441
West Bengal	3.08	7.33	3.08	7.52	64,301
Total	**42**	**100**	**41**	**100**	**8,55,176**

Source: Summary Report of the 15th Finance Commission by PRS Legislative Research

The table above indicates that,under the 14th Finance Commission, Uttarakhand received 0.44% of the 42% share and it got a share of 1.05% in the divisible pool. However in the 15th Finance Commission it got 0.45%, out of the 41% share and received a 1.1% share in the divisible pool.

Overall, the State had a devolution of Rs. 9,441 crore for the FY 2020-2021, under the 15th Finance Commission.

On the other hand, Himachal Pradesh under 14th Finance Commission, received 0.3% of the 42% share and it got a share of 0.71% in

the divisible pool and in the Fifteenth Finance Commission it got 0.33%, out of the 41% share and received a 0.8% share in the divisible pool. Overall, Himachal Pradesh had a devolution of Rs. 6,833 crore for the FY 2020-2021, under the 15th Finance Commission.

Thus under both the Finance Commissions, Uttarakhand received higher devolution in comparison to Himachal Pradesh. Besides, these allocations, grants to rural and urban local bodies were received under the Finance Commissions, details are in Table 3.8.

Table No.3.8:Some of the Grants-in-Aid 15th Finance Commission FY 2020-21 ***(in Rs crore)***

State	Revenue Deficit Grants	Grants To Rural Local Bodies		Grants To Urban Local Bodies	State's Share In Grants For Urban Local Bodies
Andhra Pradesh	5,897	2,625	4.32	1264	4.32
Arunachal Pradesh	-	231	0.38	111	0.38
Assam	7,579	1,604	2.64	772	2.64
Bihar	-	5,018	8.26	2,416	8.26
Chhattisgarh	-	1,454	2.39	700	2.39
Goa	-	75	0.12	36	0.12
Gujarat	-	3,195	5.26	1538	5.26
Haryana	-	1,264	2.08	609	2.08
Himachal Pradesh	11,431	429	0.71	207	0.71
Jharkhand	-	1,689	2.78	813	2.78
Karnataka	-	3,217	5.29	1549	5.29
Kerala	15,323	1,628	2.68	784	2.68
Madhya Pradesh	-	3,984	6.56	1,918	6.56
Maharashtra	-	5,827	9.59	2,806	9.59
Manipur	2,824	177	0.29	85	0.29
Meghalaya	491	182	0.3	88	0.3
Mizoram	1,422	93	0.15	45	0.15
Nagaland	3,917	125	0.21	60	0.21
Odisha	-	2,258	3.72	1087	3.72
Punjab	7,659	1,388	2.29	668	2.29
Rajasthan	-	3,862	6.36	1,859	6.36
Sikkim	448	42	0.07	20	0.07
Tamil Nadu	4,025	3,607	5.94	1737	5.94
Telangana	-	1,847	3.04	889	3.04
Tripura	3,236	191	0.31	92	0.31
Uttar Pradesh	-	9,752	16.05	4,695	16.05
Uttarakhand	5,076	574	0.95	278	0.95
West Bengal	5,013	4,412	7.26	2,124	7.26
Total	**74,341**	**60,750**	**100**	**29,250**	**100**

Source: Summary Report of the 15th Finance Commission by PRS Legislative Research

Uttarakhand is one among the 13 States that received the revenue deficit grants for FY 2020-2021 from the 15th Finance Commission as given in the table above. The State received a revenue deficit grant of Rs. 5,076 crore. It also received Rs. 574 crore grants to rural local bodies, which constitutes 0.95% share in the total grants made to rural local bodies. Uttarakhand received Rs. 278 crore as grants to urban local bodies, which is equal to 0.95% of the total grants made to the urban local bodies.

Himachal Pradesh received a revenue deficit grant of Rs. 11,431 crore, which is nearly twice as much the amount received by Uttarakhand. It also received Rs. 429 crore grants to rural local bodies, which constitutes 0.71% share in the total grants made to the rural local bodies, and received Rs. 207 crore as grants to urban local bodies, which is equal to 0.71% of the total grants made to the urban local bodies, both arelesser than Uttarakhand. In this context, the State could envisage policies aimed at creation of human capital and rural infrastructure with the grants received for rural local bodies and strengthening institutional capacities of urban local bodies for better governance and investing in high quality human resources.

It is equally important to ensure tax buoyancy - the responsiveness of tax revenue to nominal GDP changesshould be made robust. It is in fact a key, not only for the own tax revenues of the State but also for tax devolution from the Centre. To be more particular, there is a need to have a clear operational distinction between short-run tax buoyancy, which helps to explain the role of government in stabilising the economy over the business/growth cycle, and long-run tax buoyancy, which is the capacity of States to ensure fiscal sustainability in the long-run (RBI, 2019).

CHAPTER 4
Growth Drivers: Transformational Change For Accelerated Growth
4.1 The Primary Sector in Uttarakhand

Introduction

The agricultural sector plays a dominant role in reducing poverty in comparison to other economic sectors (Ravallion and Dutt, 1996). This belief is not archaic as the Ethiopia Poverty Assessment Report 2014 by the World Bank validated agricultural growth supported poverty reductions along with policies that targeted enhancement of rural safety-nets and focused on higher pro-poor spending on basic services. However, in the current era, the focus is on enhancing income.

The structural transformations taking place in developing economies initially saw migration of labour from the agricultural sector to the manufacturing sector or the non-farm sector. As noted by Gulati and Fan (2007), the non-farm income increases the farming household's total income. Further, as labour productivity increases in the non-farm sector with the tertiary or service sector assuming an important role, the share of agriculture in GDP falls much faster than the share of agricultural labour. Transformation continues with increase in agricultural productivity, thereby ensuring income rise of farming households and an ideal state is where the share of labour in agriculture starts to decline faster in comparison to the share of agriculture in GDP.

In Uttarakhand, the manufacturing and the service sectors have proliferated in recent times but agriculture continues to be the prominent sector engaging directly or indirectly the bulk of the population. Development in the agricultural and allied sectors contribute to the growth of the secondary and tertiary sectors through a feedback mechanism of demand and supply between the sectors. Agriculture is a State subject and therefore the onus of its development and ensuring welfare and well-being of those associated with the sector, largely remains a State responsibility. The challenges that State experiences are mostly due to its heterogeneous geography and varying ecology. It is therefore evident that any major policy initiative for the agriculture and allied sectors will be considered growth promoting. The allocation for the sector from the State exchequer may have dwindled. This may jeopardize those engaged in the sector and hurt long-term economic growth. The task therefore is to highlight the role the sector plays in taking the State economy to higher levels and at the same time, identify the factors that have been detrimental for the growth of the sector and have limited the income and welfare of its stakeholders. As the chapter will reveal, structural transformation is taking place and there are certain areas where the State policies are effective and efficiently moving towards the desired objectives. In this chapter, we first briefly present the achievements of the agricultural and allied sector in Uttarakhand. Second, we discuss key policies and evaluate the potential impact of the policies on the sector at large. Third, the challenges faced by the sector and the future possibilities are discussed with reference to existing success stories from within and outside the State boundary. A discussion on the functioning of the co-operative department is presented and how the initiatives of the department may further foster growth of agriculture and allied sectors. Finally, the chapter concludes with the key observations and recommendations.

Agriculture Dependent Population & Land Distribution

According to Census 2011, 30.23 % of the State population is concentrated in the urban areas and remaining in the rural areas. Of the total geographical area of 53,483 sq kms, 86 % is hilly area and 63.42 % is under forest cover (38.12 lakh hectares in 2018-19). It is primarily due to the terrain that very limited agriculture is practiced in the State, and therefore the net sown area is little over 11 % of the total reported land area. There is a decline in the net sown area as well as area sown more than twice in a year (refer Table 4.1). The State has 69.77 % rural population of which 67.90 % are residents of the hill districts. In comparison to Census 2001, the population in the hill districts

have fallen from 68.40 % to 65 % in Census 2011. This is mostly result of limited livelihood opportunities in the hill district and the fall in agricultural yields due to weather variability, recurrent natural calamities and man animal conflict. Various central and State sponsored schemes were introduced to make agriculture and allied activities attractive and financially rewarding without undermining the fact that the farming practices needed to be environmentally sustainable. An estimated 74 % of the population continues to dependent directly or indirectly on the agricultural sector. In Table 4.2, we compare data from two recent Census to highlight the population dependent on primary sector. In Table 4.2, we have presented information on the total workers (TW), cultivators (C), agricultural labourers (AL) and population engaged in plantation and related activities (PE). The table compares two States, Uttarakhand and Himachal Pradesh with the country level aggregates. Based on Census 2001, total workers in agriculture and allied activities represent 30 % of total population that has marginally increased to 33 % in Census 2011 at the country level. In comparison, HP witnessed a remarkable increase from 32 % to 44 % but Uttarakhand saw a mild increase from 27 % to 31 % over the two Censuses.

Role of Women in Agriculture: Interestingly, female participation as cultivators and agricultural labourers has increased in both Uttarakhand and HP. Female participation in both the States is much higher in comparison to the aggregate country level figure. In Uttarakhand, 65 % workforce was engaged in agricultural and allied activities in 1999-2000. This was much higher than the national average but subsequent development of the manufacturing and service sectors in the States and in the neighbouring States, out migration led to reduction in the proportion by 2015-16. However, women domination in the sector further intensified and they largely contribute to crop production and animal husbandry.

When it comes to land ownership, the discrimination is widespread and a subject of in-depth research. Several research studies document that women's empowerment in agriculture and establishment of equity and equality has far reaching benefits beyond increase in agricultural productivity. Evidence suggests that women are at a disadvantage with regard to their land rights in Asia and South Asia. Gender inequalities in land rights are well documented (Kieran et al., 2015 and Velayudhan, 2009). The gender differences in land ownership in general and skewed distribution of arable land in favour of males are particularly rampant in India. For example, Swaminathan et al., 2012 found that women's plots are, on an average, smaller than men's plots and they own just 12 % of land area. At the country level and in terms of number of land holdings, women have approximately 14 % of land (Agricultural Census 2015-16), which is an increase of 1 % in comparison to Agricultural Census 2010-11. In terms of area owned, it is 11.57 %. In the State of Uttarakhand too, the ownership is minimum. In terms of number of land holdings, women own 12 % land in Agricultural Census 2015-16 in comparison to 9.86 % in Agricultural Census 2010-11. With respect to area of arable land, it is 9.5 % in Agricultural Census 2015-16. *Therefore, policies that may foster growth in the agriculture and allied sectors must emphasise identification and recognition of women as the key players and formulate rights based approach that could ensure their empowerment and pride.* Uttarakhand Development Report (2009) clearly identified the benefits of women literacy on the State agriculture. The report noted that women-centric agriculture faces problems due to poor technology adoption, failure to access formal financial services, low self-esteem to participate in marketing, etc. Therefore, literacy programmes may target women in agriculture and through appropriate legislative measures may provide certain rights so that they may access credit facilities.

Distribution of Land Holdings: Table 4.3 shows the distribution of land holdings in the State alongside All-India and HP figures. The comparison of the *four* Agriculture Censuses of 2000-01, 2005-06, 2010-11 and 2015-16 is important and timely. The State witnessed an increase in number of land holdings from 897.67 thousand in 2000-01 to 912.65 thousand in 2010-11; and the 2015-16 Census reveals a significant drop to 881 thousand. In 2000-01 Agricultural

Census, 897.67 thousand farm holdings operated 843.45 thousand hectares. The average holding size in the State is less than 1.00 hectare (on an average 0.95 hectare). Moreover, 88.32 % of the total land holdings were classified as Small and Marginal holdings in 2000-01 but the recent figures for 2015-16 show a sharp rise to 91.71 %. The rate at which such holdings are increasing is the State is much higher than other types of land holdings. However, it is also true that most hilly States in the country including HP are experiencing similar trends. The total area owned by the small and marginal farmers have increased from 54.92 % in 2000-01 to 65.46 % in 2015-16. A further analysis of the district level data on land distribution would reveal that in the hill districts, the small and marginal holdings are about 93.02 % of the total operational area and in the plains, this proportion is 84.82 %. According to Table 4.4, the proportion of semi-medium, medium and large farm holdings in the plains to total operational area is higher (15.98 % compared to 6.98 % in hills).

Cropped Area & Cropping Intensity: Overall, there has been a decrease (-0.97 %) in the cropped area reported in the Agricultural Census 2010-11 compared to the Agricultural Census of 2005-06 and the earlier rounds. In the two plain districts of Haridwar and Udham Singh Nagar, the area has increased but in 9 out of 11 hill districts, the area has decreased. The change reflected in column 7 is the change in total size of operational holdings compared to the previous Agricultural Census 2005-06. Furthermore, the Agricultural Census 2010-11 reports that the cropping intensity in the State was 1.66 % (in Agricultural Census 2005-06 intensity was 1.61 %). The cropping intensity in Uttarakhand was 156.7, estimated to be more than the country average figure of 141.6 in 2014-15. Usually, crops were cultivated twice in most parts of the State that may be a plausible reason for high cropping intensity. The increase in low productive marginal and small farm holdings in the State is a matter of great concern and forces one to evaluate the efficacy and impact of farm level policies in the State. Land for agricultural purposes in the State has remained constant since the formation of the State and reportedly vertical utilisation of land is very slow paced. Rapid urbanisation in the State and the need to build the enabling infrastructure to promote industrialization and tourism has led to rapid conversion of agricultural land. The pressure on land is further exacerbated by the increasing fragmentation, declining holding size and migration of men from villages. The region also suffers on account of heavy soil erosion and significantly lower yields as compared to the national average. However, the discussion on the environmental degradation and related impacts on the primary sector are detailed in the third section.

The solution towards enhancing economies of scale from the increasing number of marginal and small land holdings could be to lay emphasis on alternatives institutional arrangements such as formation of marginal and small farmers' co-operatives, contract farming, and interventions through groups formed with the support of micro-finance and micro-credit initiatives, involving women self-help groups and promotion of local level consortia.

If any of the above measures were adopted, that would lead to a structural transformation of the farm sector in Uttarakhand, which is also believed to be *stunted*, as is the situation with the agriculture, manufacturing and rural non-farm sectors across India (Binswanger-Mkhize, 2013). Needless to mention that such measures would also significantly increase the income of the farming households. It has been long debated that one of the primary reason for farmers to leave farming is the low and declining return from this economic activity vis-à-vis any other off-farm activity.

Farmers' Income: All Indian States are working on the national mission "Doubling Farmers Income by 2022-23". The central objective is to promote farmers' welfare, reduce agrarian distress and bring parity between income of farmers and those working in non-agricultural professions. Earlier policies targeted raising agricultural output and improving food security. But as noted by Gulati et al. (2020), economic transformation in developing economies is propelled by increases in agricultural incomes underpinning industrial growth and they cite the example of China. The *Report of the Inter-Ministerial Committee on*

Doubling Farmers' Income (DFI), also known as the Ashok Dalwai Committee focused on seven major sources of growth for the agriculture sector. The Committee estimated that the income of an average farmer household in 2015-16 was Rs. 8059 per month with 60 % flowing from direct farm level activities. The strategy focuses on enhancing the income to Rs. 14391 per month by 2022-23 (at 2015-16 prices). The report shows that a farmer in Uttarakhand earns Rs. 5153 per month and non-farm income share is almost 70 %. Both the figures are very different from the country estimates. By 2022-23, the projected monthly income for the farmers in the State is Rs. 7951 (at 2015-16 prices).

The National Sample Survey Office's (NSSO) survey on *Income, Expenditure, Productive Assets and Indebtedness of Agricultural Households in India 2012-13* provides comprehensive estimates for all States. In figure 2.1, we have presented the State-wise comparison for net receipts from livestock, cultivation, total income and consumption expenditure respectively. In 2012-13, a farmer household in Uttarakhand reportedly earned Rs. 4701 per month in comparison to all India average of Rs. 6426 per month. The latest estimates on farmers' income are available from the National Bank for Agriculture and Rural Development (NABARD) *All India Financial Inclusion Survey 2016-17*. The average farm income reported in Uttarakhand is Rs. 10855 per month, which is surprisingly higher in comparison to the all India estimate of Rs. 8931. Therefore, it seems from the survey that the State may have already achieved the targets as proposed in the DFI. The point is, the survey sample has a high share of non-farm income and that the survey included only 41 % agricultural households in the total sample that on an average owned 0.63 hectare of land. Therefore, accounting for future inflation, price rise of agricultural inputs, potential withdrawal of subsidy based economic system, weather variability and price volatility, among other factors, may subject the framers to uncertain challenges detrimental to their incomes.

To ensure fulfilment of the objectives of DFI, improvements in markets for agricultural products, assurance of better prices, easy access to credit and farm income insurance, protection against extreme events, technology adoption in weather information processing and dissemination to reduce production losses are key steps. The seven sources identified by the Ashok Dalwai Committee are:

I) Improvement in crop productivity;
ii) Improvement in livestock productivity;
iii) Resource use efficiency or saving in cost of production;
iv) Increase in cropping intensity;
v) Diversification towards high value crops;
vi) Improvement in real prices received by farmers; and Shift from farm to non-farm occupations

Food Crops & Horticulture Production

The contribution of agriculture and allied sectors to the State Gross Domestic Product (SGDP) in Uttarakhand and HP have been falling significantly. The crop sector share in SGDP of Uttarakhand has declined from 7% in 2011-12 to 4.7% in 2018-19. In Uttarakhand, the growth in other sectors was much faster, resulting in a net reduction in the share of agriculture in GSDP from 25.51% in 2000-01 to 10.81% in 2018-19. These trends do corroborate with observations made by Chand et al. (2011) that rather than total production, the instability in food grains production in many India States was due to yield instability. Although, the study analyzed data only up to 2006 and opined that variations in access to irrigation and to a lesser extent variations in rainfall may have contributed to inter-State variations in instability in area, production and yield of food grains. A non-parametric (DEA-Data Envelopment Analysis) approach may help identification of the main sources of variations in productivity (not yield) through the decomposition of the total factor productivity index (TFPI). Despite the drop in the share in SGDP, the agriculture value added is on the rise and the

Agriculture State Domestic Product (ASDP) clearly reveals the trend as shown in Figure 2.2.

The *Uttarakhand Vision 2030* emphasizes a strategy of transforming hill agriculture with particular focus on horticulture, including aromatic and medicinal plants and improvement in overall productivity. The *Uttarakhand Economic Survey 2018-19* pointed to the fact that the State does not have sufficient information on climatic zone specific data on soil, water and weather conditions. The State has two distinct climatic regions: hilly terrain and the small plain. There are four agro-climatic zones and the soil characteristics play a role in crop selection and productivity. Earlier, the National Bureau of Soil Survey and Land Use Planning (NBSS&LUP) divided the soils in the State into eight different categories. The farm produce and the choice of livestock therefore are directly dependent on the soil characteristics. The State has been providing support to the farmers, enabling them to choose crop according to the soil characteristics. Uttarakhand ranked second in the year 2018, after Chhattisgarh in the country by the implementation of Soil Health card scheme operated by the centre. *The diverse agro-climatic conditions and the varied soil characteristics make the State suitable for cultivation of a variety of high-value seasonal and off-season crops.These along with fruits, vegetables, flowers and other cash cropsare the major strengths of the State to be exploited.*

Figure 2.3 depicts the area production and yield for food grains and horticulture in the State and compares the trends with that in HP and with the all-India figure. Approximately 34% of the net sown area in the State is concentrated in the plain districts of Haridwar and Udham Singh Nagar while their share in geographical area is only 10%. Further, about 52% of the district area is used for cultivation. The climate in the plains is hot and humid (tropical) and supports cultivation of crops like wheat, paddy, sugarcane and vegetables. In hills, cultivation is confined to only 11% of the area with wheat, finger millet (ragi) and small millet as major cereals. The cool climate of the hills also supports cultivation of a variety of fruits like apple, citrus, peach, pears, plum and vegetables like peas, potato, French bean and capsicum.

Though area under agriculture in the hills is relatively smaller, agriculture is the main source of livelihood for majority population in the hills. Hill agriculture is limited and trapped in a subsistence syndrome but ensures food security for the farming households. Therefore, area under food grains and food grain production are both higher in Uttarakhand than in HP.

Except for few years, yield of food grains is slightly higher in HP. However, with reference to horticulture, HP leads Uttarakhand in terms of area, production and yield. Area under food grains in Uttarakhand is continuously falling but area under horticulture is steadily improving. On the other hand, yield of horticulture is declining in Uttarakhand whileit is rapidly improving for food grains

Area under cereals has dropped from 950 thousand hectares in 2001-02 to 776 thousand hectares in 2018-19. During the same period, area under pulses has doubled from 30 thousand hectares to 60 thousand hectares. Due to significant reduction in area under cereals, total food grains area has fallen.

Wheat and paddy are major crops sown in 38% and 29.17% of the total food grains sown in the State respectively. Area under food grains in 2000-01 was 1008 thousand hectares and in 2018-19 it was 836 thousand hectares. It is important to note that, yields have improved from 1712 kilograms per hectare in 2000-01 to 2246 kilograms per hectare in 2018-19.

Oilseed crops cover close to 30 thousand hectares of cropped area in the State. Although the area has remained almost constant, productivity of oilseeds has improved.

Vegetables are widely cultivated in the State and many vegetables have status equivalent to cash crops. But, the area under vegetables remains constant though production has increased from 737 thousand tonnes to 994 thousand tonnes over the period 2001-02 to 2018-19.

Sugarcane, a water intensive crop, is cultivated by farmers in Dehradun, Haridwar, Nainital and Udham Singh Nagar (plains) districts. The area under sugarcane has dropped from 126 thousand hectares in 2001-02 to 91 thousand hectares in 2018-19. The area and production of major crops

is presented in Table 4.5.

Agricultural activities in India in general and Uttarakhand in particular are heavily dependent on rainfall, primarily due to lack of irrigation facilities. The irrigation facility in the State is limited because of the physical geography. The State has major rivers such as the Ganges, the Yamuna and the Kali-Gandaki, making the plains of the State rich agricultural regions.

The Government is directing efforts to revitalize agriculture and allied activities in the State and especially, targeting rejuvenation of hill agriculture. Hill agriculture is mostly of the subsistence type, rainfed and heavily dependent on good monsoon and conducive weather for good yields.

Gross Cropped Area (GCA)and Gross Irrigated Area (GIA): The correlation between irrigation and area under cultivation at the district-level is shown in Figure 2.4 using two variables of interest: *Gross Cropped Area* (GCA)and *Gross Irrigated Area* (GIA), plotted in different axes and observed over the period 2000-01 to 2017-18. According to Garg et al. (2015), "sustainability of irrigated agriculture would demand efficient management of available finite water resources under the existing constraints". Further, the scientific paper suggests that there is a shift in approach from maximizing yield per area (by focusing on crop adoption based on water requirement) to increasing yield under known constraints such as limited irrigation or practicing *deficit irrigation* (intentional under irrigation and minimization of water related stress on crops). Deficit irrigation for dry areas and increased water-use efficiency is well documented in academic research (English, 1990; English and Raja, 1996; Fereres and Soriano, 2007; Geerts and Raes, 2009; Yu et al, 2020). In an interesting study, Zohry and Ouda (2020) show that using the saved water from cultivation on raised beds and application of deficit irrigation to cultivate new areas with wheat resulted in 32 % and 41 % increase in its production, compared to its value under traditional cultivation. In addition, *water productivity values were highest under application of deficit irrigation and implementing intercropping systems*. The results could be very useful for the crops grown in the Rabi season in the State. The "*per drop more crop plan*" under the Pradhan Mantri Krishi Vikas Yojana is therefore a step in the right direction and an evaluation of the plan at the district level would not only help impact assessment of the plan but identify potential challenges faced at the farm level.

In Figure 2.4, it is clear that in the hill districts such as Almora, Champawat, Nainital, Pithoragarh and Pauri Garhwal, fall in GIA is matched with a fall in GCA. On the contrary, increase in GCA in Bageshwar, Udham Singh Nagar and Uttarkashi, in the recent past may be due to increase in GIA. The relationship between the two variables in Chamoli and Rudraprayag is inconclusive but for Haridwar, where GCA is falling regardless of increase in GIA implying that there could be a possible conversion of land with low water resources. Overall, a falling trend in GIA in recent years in the State is matched by significant reduction in GCA. It is estimated that over 55 % of cultivated area is rainfed with frequent moisture stress to crops. Timely rainfall is important and helps in commencement of land preparation and sowing of early Kharif crops. Therefore, rainfall variability is expected to adversely affect agricultural productivity in the hill districts. Interested readers may refer to Kumar and Parikh (2001), Mall et al. (2006), Mendelsohn (2008), to mention few to explore the economic impact of climate change on agriculture. In the next section we present a discussion on climate change and the risks associated for the primary sector. In Figure 2.5, the share of total cultivated area along with the share of total crop produce in the Kharif season is shown district-wise. Important to note that in recent years, although share of area under Kharif crops is on the rise in many hill districts, the share of Rabi crops seems to have increased in the plain districts. *This is true if one analyses he aggregate State figures. One of the contributing factors could be decline in the share of Kharif area in Haridwar*. In Uttarakhand, rice is cultivated in almost all the districts in the Kharif Season and major pulses grown are urad, gahat/kulthi, tur/arhar and bhatt. During Rabi, wheat is grown and the major pulses sown are gram, matter and masoor. Rice and wheat account for more than 60 % of the total area under food grains. Figure 2.6 shows the district-wise trends in total production and yield of foodgrains in the State. Few districts have

contributed to the increase in both production and yield in the State. Haridwar leads in both production and yield followed by Nainital and Udham Singh Nagar. Two districts where yields have improved although production has sharply fallen are Dehradun and Pauri Garhwal. The first district has witnessed rapid urbanization and the later suffered due to outmigration and abandonment of agriculture. Production shows a declining trend in Almora, Champawat, Rudraprayag and Uttarkashi. In Pithoragarh and Tehri Garhwal districts, stunted growth is observed.

Production of pulses have increased from 19 thousand tonnes in 2001-02 to 55 thousand tonnes in 2018-19 mostly due to expansion of area under cultivation of lentils such as chickpea, lentil, black gram and pigeonpea, among others. The increase is from 30 thousand hectares in 2001-02 to 60 thousand hectares by 2018-19. Moreover, the increase is higher in the hill districts. Traditionally, legumes are grown alongside other crops because they can fix the atmospheric nitrogen and thereby add fertility to the soil. Studies have noted that cultivation of pulses require less of human or animal labour and therefore is comparatively less costly in comparison to Kharif and Rabi crops. In the hills, where labour is already scarce, pulses provide an opportunity to increase farm income. Moreover, unlike other crops, pulses require less or no chemical intervention and therefore minimizes on the use of and associated cost of fertilizers and pesticides. Operational costs are further lowered when the seeds are retained for the next season. Field surveys indicate that although there are insects and diseases affecting pulses, but farmers rarely applied insecticides or pesticides. Pulses grow with lesser costs while their demand has seen marked increase, resulting in upward movement of market prices. However, it is to be highlighted that there are reports that the productivity of commonly grown Kharif pulses such as green gram, black gram, horse gram, etc. are adversely affected by various biotic (diseases and insects) and abiotic (low temperature, frost damage, drought) stresses. This manifests into poverty and malnutrition among farming households fully associated with cultivation of pulses in the region. *Therefore, pulses are supposedly useful when adopting crop diversification to minimize production related losses*. There is high demand

Horticultural Crops: There is continuous effort to make agricultural activities in the State market-oriented. After cautious evaluation of the potential for horticulture crops and the returns such crops provide to the growers, area under fruits and vegetables has increased marginally. For example, total area under vegetables was 94 thousand hectares in 2001-02 and in 2018-19 it stands at 97 thousand hectares. Yield of fruits and vegetables has increased and there are huge district level variations in area, production and yield of fruits, vegetables, potato, spices and floriculture outputs. In Table 4.6, the district-wise compound growth rate of area and production for different horticulture crops is provided. *Yields from horticulture crops are more than the open field crops like paddy and wheat. Horticulture crops are more suited to hill climate and topography. Horticulture sector holds tremendous potential to increase farm income, especially in hill districts.* Most of the hill districts have very low access to irrigation (less than 25 %). It makes growing water intensive crops like paddy very difficult that requires eight to ten times irrigation during crop period. Therefore, it is advisable to grow horticulture crops which gives higher yield even under low irrigation.

Gross Value Added: Before moving to the discussion on the effects of climate change on the agriculture and allied sector, it is important to look at the Gross Value Added from each activity. In Figure 2.7, value of output in 2015-16 at 2011-12 constant prices is presented for both Uttarakhand and Himachal Pradesh. It is evident from that the future in the two hill States is to expand horticulture, as the value added from fruits and vegetables is highest in both the States. Moreover, it is to be noted that the value of output for cereals is sharply falling and that of pulses, whose share in the total value is currently low but rising. However, given that large numbers of farmers are still dependent on cultivation of cereals, there is need to ensure basic facilities so that there are low production losses, access to credit and insurance, supply of seeds, fertilizers and other essential inputs.

Impact of Climate Change on Primary Sector

Scientific evidence indicates that average surface temperature of the planet is on a rise since the late 19th century. The rise in temperature is attributed to increased carbon dioxide and other greenhouse gas emissions into the atmosphere. The rise in temperature and associated "global warming" may not sufficiently explain the broader changes in the climatic patterns exhibited through climatological events such as shrinking ice sheets and glacial retreats, decreased snow cover, the rise in extreme events, among others. According to the Intergovernmental Panel on Climate Change (IPCC 2014, 2019), rainfall is changing its distribution and intensity and there is unprecedented exploitation of land and water resources, giving rise to possible food insecurity. The various assessment reports from the Panel also suggests that the frequency of extreme events is on the rise and more so, in terms of their severity. As climate change or weather variability evolves, further changes are projected, with temperature increasing by 2^0-4^0 C by 2100, and by 10^0 C over the next 25 years. Agricultural yields, input costs, prevalence of pests and diseases, and infrastructure needs are larger concerns.

The Himalayan region is one of the most ecologically sensitive and fragile regions in the world. This region is endowed with vast quantities of water in the form of snow and ice and remains major source of rivers that irrigate northern plains in India. Although the large forested area helps mitigation of the problems related to carbon emissions, this region demonstrates varied climate settings. It is susceptible to a multitude of extreme climatic events and natural hazards. Disasters, such as, landslides, flash floods along with other unfavourable climatic conditions such as a decrease in precipitation and heavy rainfall are a major cause of concern in both the Himalayan States i.e. Uttarakhand and Himachal Pradesh.

The Uttarakhand Development Report (2009) identified two challenges, one related to land degradation and the other, developing watersheds. The Uttarakhand Action Plan on Climate Change - UAPCC (2014) is a comprehensive document that was prepared in accordance with the principles of the National Action Plan on Climate Change (NAPCC). UAPCC clearly acknowledged the close relationship between the vulnerability of the natural and human systems to climate change and therefore attempted to incorporate strategies towards adaptation and mitigation to climate change in the broader developmental programmes adopted by the State. The strategies aimed at improving the resilience and adaptation ability of the communities, public or private infrastructures and preserving the locale ecosystems. The issues, challenges and priorities identified by the UAPCC are presented in Exhibit 1. *It is to be noted that, the State action plan did not undertake or report any vulnerability assessment study to identify the sectors or areas that could be severely affected by extreme weather events.*

The Climate and Development Knowledge Network (CDKN) have been supporting the implementation of the strategies identified under UAPCC and have been in a way assessing the progress through assessment of key stakeholders involved in the design, implementation and monitoring of the adaptation-focussed strategies. GIZ (2016) reviewed the implementation of the strategies through an innovative procedure referred to as SSNAP (Stocktaking for Sub-National Adaptation Planning). The procedure is an assessment of the govt.'s current capacity for adaptation planning and arriving at a consensus on how to prioritise actions. The two key insights from the evaluations are as under (refer page 49 of the report):

1. *The climate plan needs to be better communicated.*
2. *While individual States have developed a climate plan with varying degrees of climate information, and institutional capacity, they are struggling with implementation, mainstreaming&monitoring &evaluation.*

The SSNAP for UAPCC strongly proposed creation of the *State Climate Change Centre* and creation of a platform for knowledge and data sharing. The State Climate Change Centre (SCCC), Uttarakhand was established on 8-Jun 2016 to formulate climate actions with support from the United Nations Development Programme (UNDP) and other partners. The SCCC, therefore should work closely with the government line departments so that policies can be formulated for effective and efficient implementation of farm based adaptation policies

thereby limiting farmers exposure, who are left to the vagaries of weather.

The vulnerability assessment of different agro-ecologies and valley regions in the State is a daunting task. Efficient implementation and execution of strategies towards alleviating the climate change concerns requires understanding of local specific hazards, exposure of lives and livelihoods to the hazards and perils, the vulnerability of the communities and thereby identifying the risks associated with the system. Hill agriculture is highly risky and assessment based on the procedure detailed in Figure 2.8 is helpful for future planning of strategies or for modifying those existing relevant strategies. For example, the Action Plan did not propose new policies but identified many existing central and State sponsored policies that were in a great way contributing to limit the losses due to climate change. Some of the earlier vulnerability assessments were carried out by WWF India (the study on the Ganga Basin), Uttarakhand Centre for Climate change and Kumaon University joint report on climate change evidences and impacts on water resources, study by Uttarakhand State Council for Science and Technology (UCOST), Uttarakhand Science Education & Research Centre (UKSERC) and DST, Uttarakhand, to mention a few. There are few studies exploring the community level perceptions regarding impact of climate change. Important studies are those by the International Centre for Integrated Mountain Development (ICIMOD) and International Fund for Agricultural Development (IFAD) (2011), Maikhuri et al. (2019).

The key message from these studies is that *it is important to document and understand the traditional knowledge of the farming communities before enforcing a strategy. For ensuring sustainable practices, the adaptation practices need to be localised and the benefits should reach the smallest farmer in the community.*

Understanding of risk perception is key to improvements in yields, According to a report by Oxfam (2014), "In disaster-prone Uttarakhand, a constant state of disaster preparedness at every level has to be integrated with development. Uttarakhand needs to strategically implement the Disaster Management Act, 2005. Technology-based approaches like early warning systems should be supplemented by community-based disaster preparedness (CBDP)." Balasubramanian and Kumar (2014) analysed the 2013 Uttarakhand disasters and opine that the events were due to the effects of climate change and that the development policies need to recognise the needs of the fragile Himalayan ecosystems. The study by Rautela and Karki (2015) show that there is evidence of climate induced changes in hydrological regime & agricultural productivity, phenological changes in wild and cultivated crops are common observations and there is loss of livelihood capital, changing agro-livestock conditions and emergence of invasive species.

Various issues of the Uttarakhand Economic Survey presents the annual trend of rainfall in the State. Observations regarding rainfall and especially monsoon downpour are that it has become erratic, winter rains are mostly absent, intensity of less frequent heavy rainfall has increased, rise in temperature due to extended dry season, decreased water availability and overall rising temperatures. *It is important to analyse the spatial variation for meaningful use by policymakers*. The IHCAP (2019) report presentsvulnerability assessment of 12 Himalayan States. State-level vulnerability index show that Uttarakhand and Sikkim have the least vulnerability and their position is 11th and 12th respectively. The composite vulnerability index is composed of four main indicators: *socio-economic, demographic status and health; sensitivity to agricultural production; forest dependent livelihoods; and access to information services and infrastructure.* There are different sub-indicators for each of the four indicators and weights have been assigned to each for generation of the composite index. The district-wise vulnerability assessment for Uttarakhand show that there are a few districts those are clearly susceptible to climatic events. Rudraprayag and Pithoragarh districts have higher vulnerability ranking and Dehradun has the lowest rank. Interesting to observe that Haridwar, along with Rudraprayag and Pithoragarh are identified as high. vulnerable districts. Figure 2.9 shows the district-wise vulnerability ranking and the vulnerability categories A comparison of Figure 2.9 with Figures 2.4 and 2.5 provide interesting

insights. Climate change may have led to reduction in both GCA and GIA; resulting in stagnation in production and productivity in Pithoragarh and Rudraprayag districts. The Kharif production in recent years is showing a decline. *Therefore, the policies that the government is currently providing to rejuvenate hill agriculture and future plans should be mapped with the locale specific hazards& vulnerability.*

Hill agriculture can become a growth driver if and only if policy-making acknowledges the climate threats, includes community perception in framing adaptation policies and encourages participation of all through structured dissemination of scientific knowledge to those who may be currently far distance from adopting modern technology

Alternative Practices and Allied Agricultural Activities to Enhance Income

a) Organic Farming

According to the *World Organic Agriculture: Statistics and Emerging Trends 2016* (APEDA 2017), India holds a unique place in organic farming across the globe. It had 1.18 million hectares of organic agriculture land (8th country in world) and 650.20 thousand farmers (highest globally) were involved in organic farming in 2016. Among Asian countries, India comes second after China in terms of land occupied under organic farming. The largest grown organic crop in India is organic cotton followed by oilseeds. The organic crops grown in the country are largely exported to other countries. It is observed that farmers opting for organic farming initially face huge losses (APEDA 2017). Therefore, a better market for their products is needed, supported by incentives and protective benefits for farmers in order to raise their productivity. Such may act as motivation for more farmers to opt for organic farming. It is to be noted that the demand for organic products are rising especially in developed nations. Uttarakhand can avail this opportunity by expanding its organic farming activities efficiently and effectively in the State. Hill agriculture in general is less dependent on chemical use to stimulate yield. Further, in many districts, farmers still save and sow traditional and local varieties of crops, especially pulses and coarse cereals. The State has recognised the potential for expansion of area producing horticulture, floriculture, herbs, spices, medicinal plants, herbal pants, agro and food processing industry and organic farming (State Agriculture Plan 2017). Govt. policies thus far have encouraged farmers to shift away from conventional crop production to high value, especially horticulture crops using sustainable practices. The Uttarakhand Organic Commodity Board (UOCB) was formed in 2003. The board is acting as the nodal agency of the State to enhance organic activities in agriculture and allied sectors. The promotion of organic revolution in the State from organic farming to food products (including chemical free feed to livestock) has come a long distance and the State approved the Organic Agriculture Act (2019), reportedly first in the country. One of the important feature of the Act is that it completely prohibits the sale of certain banned chemical fertilizers and calls for heavy penalty (fine amount reaching up to 1 lakh) if a seller is found to be selling the banned substance(s). UOCB has been playing an active role for the marketing of the organic products but problems mostly due to *transportation, storage issues, processing and packaging, quality control and certification, efficiency of the supply chain, among others* are deterrent to the growth in adoption of organic farming in the State. Sati and Wei (2018) observed that in the highlands (1800–2800 m), which fall under temperate agro-climate zone, multi-grain (Barahnaza), millets, pulses, oilseeds, potato, vegetables, apple, almond, pear, and peach are grown largely. Cold alpine meadows are suitable for growing medicinal plants. Spices mainly ginger, garlic, chilli and turmeric grow from tropical to temperate zones. The soil fertility and the organic content should be a parameter for crop selection. Further, subsistence agriculture dominates in the mountain areas of Uttarakhand accounting for about 80 % of the arable land. Crops like potato, fruits and vegetables have comparatively high productivity but constitute only 10 % of the arable land. Therefore, the govt. should focus on policies to reverse this trend. Paneerselvam et al. (2010) study the effect of organic agriculture on the food

security dimension of small land holders in three Indian States – Madhya Pradesh, Tamil Nadu and Uttarakhand. They observe that with current set of policies, infrastructure and incentives, the yield from organic farming is comparable to conventional farming. However, lesser-input requirement saved costs and possibility of intercropping helped substantial increase in income. Adoption of organic farming may limit exposure of smallholders to climate change.

Based on a field survey of organic farmers and conventional farmers in three selected districts in Uttarakhand (Dehradun, Tehri Garhwal and Nainital), Subrahmanyeswari and Chander (2013) show that organic farming has revived the interest of farmers, policy makers, and development workers in indigenous knowledge and farming practices, now mostly assumed to be sustainable in nature. In another study by Panneerselvam et al. (2011), they found that there is a need to consider a balanced view on the disadvantages and benefits of organic farming and that the farmers' worries concerning marketing barriers, health, environmental and production factors need to be discussed in the farming communities. *Dissemination of information through a help line to assist farmers to engage in organic farming*. The State may consider the experiences of Sikkim, Tamil Nadu, and the north-eastern States in this regard. Table 4.10 presents a list of State and country experiences with respect to organic farming. The State Vision 2030 proposes that organic farming will be enhanced from current 35,000 to 2,50,000 hectares by 2030. Further, for certification, third-party agency would be involved.

If the projected increase in area under cultivation of organic crops and the associated increase in the farmer participation is realised, the State may also consider crop specific introduction of crop insurance schemes. In the long run, steps may be taken to develop a separate online market for organic produce (using mobile applications) so that the demand and supply uncertainties are reduced.

a) Livestock & Fisheries

Along with the increase in the demand for food, the demand for livestock and its products are on the rise. This surge in demand has been termed as "livestock revolution" (Swanepoel et al., 2010). Livestock plays a significant role in the developing economies especially in the rural areas as they are a major source of income and employment. They serve as financial asset and provide safety net to the poor, especially to women and other pastoralist groups, in addition to providing with nourishment for billions of rural and urban households (Freeman et al., 2007). However, *livestock can be both positive (for instance, enhance income) as well as negative (for instance, pollution and the associated impact on carbon footprint)*.

Livestock products are high-value products as compared to crop production. Over the last 40 years the value of livestock production has seen an average 2.7 % growth in Sub-Saharan Africa, 3.4 % in Central America and 4.1 % in South-East Asia. More than 80 % of the Africans keep livestock, and between 40 % and 60 % of the poor in India and Bangladesh respectively have some livestock (FAO, 2009). Babatunde and an average 2.7 % growth in Sub-Saharan Africa, 3.4 % in Central America and 4.1 % in South-East Asia. More than 80 % of the Africans keep livestock, and between 40 % and 60 % of the poor in India and Bangladesh respectively have some livestock (FAO, 2009). Babatunde and Qaim (2010) argue that *households with non-farm income (with reference to livestock) consume significantly more calories as compared to those without non-farm income, so that there are fewer instances of under-nourishment in the former*. Similar is true with the dietary qualities and the proportion of high-value foods such as fruits, vegetables and animal products. Across the developing countries, 68 % of the households earn income from livestock (Davis et al., 2007). Staal et al., (2009) analysed 92 case studies from the developing countries and found that livestock, on average, contributed 33 % of the income in mixed-crop livestock system, with higher income being associated to dairy and poultry farming. They also reported that average income from livestock is 55 % of total income. The growth in the demand for milk and meat products has been projected to

double by 2050 (Delgado et al., 1999 and Rosegrant et al., 2012). The rising demand for milk, meat, fish and egg has generated employment all along the livestock value chain. Livestock plays multiple roles in supporting livelihoods, the most important one being as a source of household income. Grace et al., (2007) argues that livestock is a major source of employment across the informal sectors of countries in Asia and Africa. Animal source foods are the most commonly sold street foods, which in turn are mostly managed by the informal street vendors (Perry and Grace, 2009), comprising mainly of poor women. It is estimated that around 1.3 billion people are globally employed in different livestock value chains (Herrero et al., 2009). *Therefore, livestock have the potential of playing multiple roles of generating employment, enhancing income and minimising the worries related to food insecurity.*

Increased economic activity in livestock ensures forward linkage by enhancing the processing and marketing activities and backward linkage by ensuring demand for the inputs in the livestock rearing and allied activities (McDermott et al., 2010). Livestock are often one of the main assets that rural households possess. These a*ssets are used as collateral and facilitate access to credit and financial services, as well as increase social status of the owners*. In the absence of formal institutions such as banks and insurance, livestock serve as "piggy banks", and a way for people to save and store money and manage risks (Pell et al., 2010; Birader et al., 2013). It acts as "moving banks" to the people, serves as capital in case of landless labourers. There are also sports and competitions of cattle across various communities, which attract tourists (20th Livestock Census, India). India stands as the highest livestock owner in the world at about 535.78 million livestock. Livestock accounts for 4.9 % of the GDP in 2017-18 (NAS, 2019). Nationwide about 20.5 million families are engaged in livestock rearing and derive more than 16 % of their income from livestock rearing and allied activities. It provides employment to 8.8 % population in the country (Department of Animal Husbandry and Dairying, 2019). Helping households to enhance the benefits and minimise the risks associated with the livestock production can serve as an important contribution to improving the livelihood of the poor in the hill districts of Uttarakhand. The contribution of livestock in GSDP is 2.69 % (Economic Survey, 2017-18) and the contribution to the Per Capita Income is 2.69 % (Animal Husbandry Department, Uttarakhand). According to the 20th Livestock Census, the share of Uttarakhand in all India livestock and poultry population was 0.82 % and 0.59 % respectively. The total population of livestock including poultry in the State in the 20th Livestock Census is 94.41 lakhs in comparison to 96.64 lakhs reported in the 19th Livestock Census. As noted by Sati (2016), this decline could be because of migration of people (about 20 % causing fall in goat, sheep and lamb population) from the highlands to the valleys and other parts of the State associated with a change in their occupational structure. The study further estimated a livestock density at 81.5 per square km and 0.5 per capita for the year 2013-14 and both the indicators are below the national average. One of the major reasons for this may be the geographic features of the State, limited grazing lands and that mixed livestock farming system existsin Uttarakhand, both sedentary and migratory. Table 4.6 and 4.7 shows the livestock and poultry statistics for Uttarakhand.

Livestock, mixed with crops serves as an important component of farming system to strengthen ways of improving their management for long-term sustenance and profitability. According to the 20th Livestock Census, India is the largest producer of milk in the world, second largest in the production of fish and aqua-culture, third largest in the production of sheep, second largest population of goats in the world and fifth largest population of ducks and chickens. It provides food, fibres and skins in the form of wool, hairs and pelts. It also provides leather for domestic use and exports, which have a very high export potential. Uttarakhand has received Rashtriya Gokul Mission Awards in 8 Hill and 3 North-Eastern States category. During the financial year 2016-17, the State received first prize in Kamdhenu Awards for breeding Red Sindhi breed and Gopal Ratna Award for rearing Red Sindhi Cow in Bageshwar. In the financial year 2017-18, the Best Performing State award was conferred in addition to the best Artificial Insemination Award, among others. The State has come up with a number of *schemes* such as the

Backyard Poultry Scheme. *Bhed Bakri Palan Yojana,* in which a set of 10 female and 1 male sheep or goat was provided to the SCs/ST community at a 90 % subsidy. *Cow Breeding Scheme*, which enabled every member of SC/ST community of the BPL category with one cow. It provided employment to 892 people in 2016-17 and 652 people in 2017-18. Similarly, goats were also distributed to serve as means of livelihood. These schemes are in addition to the central govt. schemes including those under the flagship National Livestock Mission, Fodder Development Scheme, Dairy Entrepreneurship Development Scheme, Fodder Development Scheme, to mention a few.

Animal Health: In order to deal with animal diseases, the State built 328 *clinics* and 778 *dispensaries*. *Assistance to State for Control of Animal Diseases* (ASCAD) provides protection against foot and mouth disease, haemorrhagic septicaemia, black quarter, Ranikhet disease, fowl pox and rabies. For fertilization of cows/buffaloes, the *Deep Frozen Semen Production Scheme* was introduced. An estimated 35338 animals were insured in 2017-18 under the *Livestock Insurance Scheme*.

Goat Rearing, Wool & Diary: Uttarakhand Sheep and Wool Development Board attended to the needs of those engaged in the rearing of sheep and shearing of wool. The State also has its own *Wool Clipping and Marketing Scheme* with online wool tracking system. The *Ahiliyabai Holkar Sheep and Goat Development Scheme, Integrated Livelihood Support Programme* and the *Women Goat Rearing Scheme* support the livestock owners and provide an impetus to women to become self-reliant. The State also has *Women Dairy Development Scheme*, providing a support of Rs. 456 lakhs to 26 female milk committees. Women benefitted largely from the *Ganga Cow Women Dairy Scheme*. There are 14956 beneficiaries of the Dairy Development Programme in the State. Automatic Vending Machines have been introduced in the State with a capacity of 200 litres per machine, benefitting an estimated 200 to 300 families.

Fisheries: Table 4.8 presents the information related to progress of fisheries in the State. Over the period 2007-08 to 2017-18, the value of fish produced has increased more than the actual production of fish. The Contribution of the Fisheries to the State GSDP is 0.03 %. The State is endowed with rivers and water bodies (lakes and reservoirs constitute about 25 thousand square kilometres and ponds constitute about 800 hectares). *The future growth potential may come from conservation of indigenous varieties of fish and promotion of tourism around fishing.* The Uttarakhand Fisheries Department (UFD) runs many schemes to encourage fisheries in the State that aims at providing village society ponds and community land on lease, assistance with regard to technical guidance and training, pond construction and betterment, subsidy and loan for fishery activities, making fish seed and feed available and sensitise communities regarding govt. sponsored programmes related to fisheries. The drivers of change for the fisheries sector have been identified as govt. support and approval for Public-Private Partnerships, adoption of the "Blue Revolution" or the Integrated Development and Management of Fisheries, substantial increase in subsidies for promotion of inland fisheries (from 20-25 % to 50 % of project cost), focus on exports, and finally expansion of critical resource base from inputs to institutions helpful for growth promotion. Some of the important central and State sponsored schemes to boost the growth of fisheries is presented in Exhibit 4.3.

a) Co-operatives

Agriculture societies are the mutual association of farmers to pool their resources together to maximize the benefits of their members unlike maximization of profit seeking enterprises (Thorner 1962). The logic of setting up or promoting these cooperatives was the market-failure due to profit seeking enterprises engaged mostly in supply of farm inputs. By pooling production resources, farmers enjoy a common scale of efficiency and maximize their benefits. Therefore, agriculture cooperatives are a helpful source to generate resources for farmers that they could not avail at an individual level.

Agriculture sector in India employs 50 % of the workforce of the country (Economic survey 2019). Despite this fact, the sector remains neglected and provisions of many agricultural services remained inadequate, to make it inefficient and unproductive, discounting the

successful stories of green revolution in selected Indian States during the 1960s. Farmers' sufferings are often explained by unpleasant events. Every year, farmer's suicides are reported in different States and the reasons cited for such extreme steps are crop failures, insufficient or absence of alternative social safety nets or absence of social security measures to cope up with the rising cost of farming and indebtedness. This makes India's agriculture fragile, vulnerable and unproductive (Nandi and Nedumaran 2019). The risks in general are on the rise. To solve many such problems including those of ensuring availability of proper credits for farming activities, production resources, etc., agriculture societies are formed (Mohan 2006).There are a number of successful cooperatives in India such as the *Indian Farm and Forestry Development Programme* (IFFDC), the *Indian Farmers Fertiliser Cooperative Ltd.* (IFFCO) and the *Krishak Bharti Fertiliser Cooperative Ltd.* (KRIBHCO) in the fertiliser sector. Institution such as *Anand Milk Union Limited* (AMUL) in dairy Sector and Self Help Groups (SHGs) formed by many institutions for variety of purposes including providing the much needed support to the agriculture and allied activities (Kumar et al 2015). The process of formation of a cooperative is presented in Figure 2.10, although every cooperative movement has its own origins and history. The experiences of the cooperatives show that they are helpful in solving many problems such as ensuring access to productive seeds to facilitate end-up recycling of farm wastes. The IFFDC has developed and produced million tons of good quality productive seeds and procures them for distribution to the members. The agriculture societies are further classified as agriculture production societies, agriculture marketing societies, agriculture services societies, among others. The central power, however, remains in agriculture credit cooperatives, Primary Agricultural Credit Societies, or PACS that often bridge different societies together. The cooperatives work for local needs and help to solve the local problems. The cooperatives also help increase reverse migration as these societies advance the opportunities of self-employment at the village level. Uttarakhand enacted the *Uttarakhand Cooperatives Act 2003* to consolidate different funding programmes for enhancing the hill economy. *The cooperatives in the State are playing a significant role*. The Cooperative Department is running six broad schemes namely: *Cooperative Partnership Plan*, *Cooperatives Loans and Adhikoshan Yojana*, *Cooperative Deal Plan*, *Customer Cooperative Plan*, *Cooperative Education, Training and Dissemination*, and *Fertilizer Transport Subsidy*. The main functions of the Department include creation of awareness about the cooperative movement, help the farmers in getting access to finance and credit at low-cost, ensure timely availability of funds to invest in farming and allied activities, supervise the pricing of agricultural produce of given cooperatives, support marketing of farm-products, diminish the influence of money lenders, among others. It helps the society members to access easy credit for education and health as well. The State cooperatives also aim to create opportunities for self-employment for its members. Such initiatives are important as these may reduce out-migration and stop the ill-fated transformation of villages into "ghost villages". *The department is also helping in promoting tourism and supporting village and community level cooperatives. It is to be verified with substantial evidence whether or not cooperatives were helpful in enhancing dairy business and horticulture in the State. However, potential for the cooperatives exists in the State to grow, in terms of both their outreach and expanding their range of activities.*

The annual report of the Cooperatives Department for the year 2019 shows that the cooperatives have managed to achieve their targets only partially. Cooperatives in the State registered poor growth in membership, which increased by 26,687 against targeted 100,000. This shows that the Department was unable to convey the message of the cooperative movement to its potential clientele. However an improved performance of cooperatives in the State is evident, based on different indicators for achievements against targets in the year 2019-20. *This may be a reason for initiating the Integrated Cooperative Development model in Uttarakhand for future development of the State*. The targets and achievements of physical progress made by the Department over the period 2015-16 to 2019-20 is detailed in Table 4.9. A plan was proposed to

make all the cooperatives in the State work together. It is undoubtedly an ambitious plan. The efforts with regard to cooperatives may provide a low-cost solution based self-employment opportunities, again urgently required in the State for restricting out-migration. *In this model, it is proposed that different Departments, which could bring harmony to the primary sector, may be integrated for better action-oriented policies in the State for welfare of its people*. Some of the significant budgetary announcements (2019-20) with regard to cooperatives are the Deen Dayal Upadhyaya cooperative farmer welfare scheme that would provide loans up to Rs. 1 lakh for agro-processing units and agricultural works at zero percent interest rate. The targeted beneficiaries are the small and marginal farmers in the State. An estimated Rs. 50 crore has been allocated for the scheme that is aimed at benefitting 659 thousand farmer households based on 2015-16 Agricultural Census. Another scheme announced is, support of zero interest loans of up to Rs. 5 lakhs to the self-help groups exclusively working in agro-related activities. In 2018-19 budget an amount of Rs. 30 crore was earmarked for the *Deendayal Upadhyay Sahkarita Kisan Kalyan Yojana,* which promises low interest rate loans for marginalized farmers. The role played by PACS in the State is very significant and has enhanced both the farm and off-farm incomes. There are 759 credit societies with the largest concentration in Pauri Garhwal (134) followed by Pithoragarh (112) and Tehri Garhwal (87). The prominent programmes are Silage Production and Distribution (with a sanctioned amount of Rs. 175 lakhs), Naugaon Marketing Uttarkashi (an allocation of Rs. 354.34 Lakhs) and MPACS Takula (Rs. 20.76 Lakhs). There are other programmes for which the funding is distributed through the Cooperative Department to the Department of Animal Husbandry (one programme of Rs. 2500 lakh), Department of Fisheries (2 programmes of Rs. 1624.85 Lakhs) and Dairy Development Department (3 programmes of Rs. 344.68 Lakhs). One of the innovative schemes of the Department is - women run cooperative banks' branches in the State. The first branch was opened in Banjarawala, Dehradun on 30'lakh at 2 % interest rate for agricultural purposes and education loans at the rate of 8 %. As on February 2020, there are 10 such branches holding accounts of 8949 customers and a total savings deposit of Rs. 24.57 lakhs. The NCDC has earmarked Rs. 100 crores as the first instalment for different projects undertaken by the Cooperative Department. The Department is also promoting Ayurveda and naturopathy (usage of medicinal plants and herbs) and have 56 *samitis* identified as the *Patanjali Sehkari Arogya Kendra*.

To conclude, cooperatives are playing an important role in channelizing people, their knowledge and resources to together maximize the benefits for its members. Women also get empowered and are actively participating in finance related decision making with the help of these societies. Cooperatives are becoming facilitators of agriculture extension services in many forms such as Agriculture Technology Management Agency (ATMA).

Government should promote Cooperatives to become stronger, more professionaly run and provide better rules and regulations that can increase the flexibility of the registered societies, guide formation of new societies and engage in thorough assessment and impact evaluation of the programmes towards income increase, livelihood diversification and overall rural development.

a) Other Activities

Mushroom Cultivation

Mushroom belongs to fungi species, which is a good source of high quality protein (20-35 % dry weight). Presently three varieties of mushrooms are cultivated namely, *white mushroom* (Agaricus bisporus)*, the paddy-straw mushroom*(Volvariella vovvacea) and *oyster mushroom* (Pleurotus sajor-caju). The first variety is globally the most cultivated mushroom, contributing 35-40 % of the world production. Mushrooms contain many vitamins and minerals, like B-complex, iron and are good sources of quality proteins, such as, lysine. It is completely fat (cholesterol) free and rich in anti-oxidants. In India, Punjab, Haryana, Himachal Pradesh, Uttar Pradesh, Rajasthan and Jammu and Kashmir are major mushroom producing States. Punjab, Haryana and Himachal

Pradesh account for nearly 90 % of country's production. Though mushroom has been a non-traditional cash crop grown indoors in India, they are cultivated as a seasonal crop and under controlled environmental conditions. Over the period 2010 to 2017, the mushroom industry in India has registered an average growth rate of 4.3%. Out of total mushroom produced, white button mushroom share is 73% followed by oyster mushroom (16 %), paddy straw mushroom (7%) and milky mushroom (3%). Mushroom cultivation gathered pace in the States of Maharashtra, Tamil Nadu, Karnataka and Andhra Pradesh because of mushroom production under controlled conditions through adoption of technology.

Given the success of Himachal Pradesh, farmers see better income prospects with mushroom cultivation in Uttarakhand. The mushroom industry in the State has witnessed a windfall in production in the last eight years. The State produces ample amount of mushroom and also registers cultivation of all the three commercially viable mushrooms varieties. Button mushroom cultivation is highest (80 %) in the State, followed by oyster (12-13 %) and milky mushrooms (7-8%). The production of mushrooms is higher in the Garhwal region as compared to the Kumaon region. Haridwar and Dehradun are emerging as the hubs of mushroom production with many units exporting their mushrooms to as far as Europe. The State promotes cultivation of mushrooms in both controlled as well as seasonal environment. Lately the emphasis is on *organic mushroom* cultivation. According to the State Horticulture Department, there are 25 big units currently in operation cultivating mushrooms in controlled environment whereas 225 farmers are doing seasonal cultivation.

As mushrooms could be grown indoors, the output losses due to extreme weather, natural calamities, and animal attacks have low to zero probability. Women are playing a major role in boosting mushroom production in the State. There are State sponsored schemes providing up to 50 % subsidy on spawns and fertilisers along with free training to mushrooms cultivators. A *Centre of Excellence for Mushrooms* under the "Integrated Horticulture Project" is set up where research is undertaken to improve the quality of mushrooms. *There are many barriers hindering successful mushroom cultivation such as limited number of shops selling spawns and limited technological know-how. Further lack of infrastructure, lack of pricing mechanism and unavailability of markets, are additional challenges*.

Organic Tea cultivation

Uttarakhand has favourable agro-ecological conditions to cultivate tea mostly on the gentle mid-slope areas. This was the main reason the British East India company started tea cultivation in Uttarakhand during 1830s. In mountain regions, where options for enhancing and diversifying livelihoods are less, tea cultivation is one of the promising sectors, subject to availability of favourable landscape and agro-ecological condition. Recently the State has established many tea nurseries and tea gardens in the Kumaon and the Garhwal hills where production is ongoing.

The State has around 1100 hectares under tea cultivation with only five tea estates, four of which are State owned and the remaining one is a privately-run tea estate. While the privately run tea estate lies unproductive, the remaining four tea estates, each equipped with a tea processing unit, produced 70,000 kg of tea in 2017-18. *Uttarakhand Tea Development Board* has developed about 1185 hectares of tea farming in hilly areas of the State in 2017-18.

Government of Uttarakhand is planning to boost tea cultivation along with *tea tourism in the State* (like in Darjeeling, West Bengal and tea estates in Assam) as tea grown on the rolling hills will add to the region's scenic charm. *Tea tourism and focus on organic tea production and processing units may play a vital role to curb the forced migration from hills to plain areas*.

The timing is ideal as the demand for organic tea within the country and abroad has shown and increasing trend in recent times. An area of 485 hectares of Nauti (in Chamoli district), Ghorakhal (in Nainital district) and Champawat tea plantation has been converted into organic tea cultivation areas. A provision of Rs. 17 crore was made under the State's *Tea Development Scheme* in the annual budget 2018-19. There is need to market "*Made in Uttarakhand*" tea in the international market.

This sector is also facing many hurdles. *There is urgent need of more skilled labour force with organised market structure. There is a need to promote tea cultivation by giving a conducive framework so that local farmers could lease out their land to investors for tea cultivation*.

The govt. may allocate funds for training and exposure of those interested in tea cultivation. Selected enthusiastic farmers should be identified and sent to West Bengal and Assam and even to Sri Lanka, for exposure to the global best practices and production technology. Certification of the different grades of tea will be required. The cooperative movement should be encouraged to consider tea cultivation and scattered land in the hill slopes owned by different farmer households could be converted to tea estates owned and operated by the cooperatives and supported by the State.

Apiculture

The hilly regions of the State are blessed with densely populated flora and fauna that attract *Apis cerna indica*, commonly known as Indian honeybees. It creates a prospect for local enterprises with professional support to transform the lives of thousands of rural people mainly women, both socially and economically. Guptakashi in the Rudraprayag district of the Garhwal division is emerging as the hub for beekeeping business in the State. Beekeeping has been a traditional activity of many households since ages. Warmth of the traditionally made hill houses in the relatively cold weather attracts bees to create their colonies near human habitation. *In the urban centres, organic honey is in high demand due to its health benefits and medicinal properties*. The gap between the fragmented producers' base in the remote hills and the affluent consumers' base in the urban places is considered an opportunity to create a rural enterprise with decentralized production and centralised processing and marketing. The State occupies 9th position in honey production in which major contribution is from the Nainital district. Total number of beekeeping units in Uttarakhand is 8700 that produced 2500 MT honey in 2016-17. Nainital, Haridwar, Pauri Garhwal and Pithoragarh districts are important honey producing districts. Uttarakhand government is setting up the State's first *Himalayan Honey Testing Laboratory* at Jeolikot in Nainital district to check the purity of harvested honey. Recently State government has announced hike in subsidy to beekeepers from Rs 50 lakh to Rs 1 Crore. *Government intervention in the marketing of honey is inevitable since beekeepers are forced to sell honey at low prices to the traders in the absence of organised marketing and procurement system in the area*. Since apiculture doesn't require large land area, this could be a viable allied agricultural activity helping farmer households to increase income.

Policies, Programmes, Budget Allocations:

Exhibit 4.4 presents the highlights from the State annual budget to foster growth of agriculture and the allied sector. Exhibit 4.5 lists out selected policies and programmes that the Directorate of Agriculture and the Horticulture Department are implementing and supervising in the State using Central and State financial resources. Uttarakhand Economic Survey provides a snapshot of the progress and achievements made under each programme. However, it is true that despite such efforts, the situation at the farm level is below expectation. Most of the policies, especially those under 100 % sponsorship by the Central government are being implemented, but the policies per se do not often have the desired benefits for the target population. *The policies are too top-down in nature and the area specific requirements of beneficiaries are not taken into account while designing and execution of the schemes*. Few reasons behind slow subscription and/or participation of farmers in these programmes are lack of awareness and knowledge, lack of experience and hesitation to innovate. In addition, the confusing and at times complicated procedures, along with uncertainties with regard to actual release (or receipt) of funds, make programmes discouraging. *It is widely accepted in policy studies and research, that every policy needs to be assessed in terms of its impact not only on raising productivity, income and livelihood opportunities but also in terms of experiences the beneficiaries had while availing the policy benefits and assessment of factors which may motivate future participation in government sponsored projects and programmes*.

Impact of COVID-19

Country-wide, the harvesting as well as the post-harvest handling of produce of the agriculture sector faced a setback as a consequence of the COVID-19 lockdown. Although not a well performing sector in the pre-COVID times, unlike other states the agriculture sector in the hills of Uttarakhand remained insulated to an extent since the farmers are less dependent on hired labour. Except for the loss of income and revenue during the month long absolute shut down, the family labour continued to work on the fields and supplied essential commodities to the market, as permitted by the authorities. In addition to the loss of produce due to lack of transit, the state saw loss to farm produce owing to hailstorms in the month of April.

Since maximum contractors engaged in horticulture come from outside the state, the sector saw shortage of workforce in the sugarcane growing plains of Uttarakhand. There have also been revenue losses in floriculture due to crashing demand.

There were fluctuations in demand and supply in the Livestock and Dairy sector, accompanied by poor animal health due to lack of logistics during the lockdown. The poultry sector faced the brunt of rumours and fears about the safety of meat and egg consumption.

In order to boost the economy and to engage the reverse migrants in economic activities the COVID Action Task Force recommended higher safety and quality guidelines, value addition through processing and the revival of the "One Village One Farm" concept for various activities under agriculture, horticulture, fisheries, apiculture, as well as animal husbandry.

WAY FORWARD

In the next few paragraphs, we summarise the discussions above and suggest possible measures that could make the primary sector a growth driver.

The State sponsored programmes and schemes (available in Vol. 1 of the Uttarakhand Economic Survey), are based on the Uttarakhand Agriculture Policy 2018. The document provides preliminary information about the state of agriculture and allied activities but lacks observations at micro-level, such as the farmers' perspective on the future of the farm sector.

Agro-Climate Specific Interventions: There is a need to expand agro-met services in the State including interventions designed based on locale specific agro-climate. An effort to increase the dissemination of weather information in the local dialect of the language spoken by the communities may be helpful in farming decision-making, especially during sowing and harvesting.

Assessment of Impact in Terms of Number of Beneficiaries: The State is implementing many schemes but the policy should recognise that disclosure on the number of actual beneficiary farmer households is important to assess the effectiveness of the programme. The focus with regard to policies and programmes has been physical (area or production) and financial achievements. However, if policies benefit large number of farmers, it would be welfare enhancing. Further, data on number of beneficiaries, etc. should be collected and made available at the micro level.

Dissemination of Best Practices and Support to Upscale: There are many pilot programmes being implemented in the State at the village/community level by non-governmental organisations such as HARC (Himalayan Action Research Centre), MVDA (Mountain Valley Development Association), TERI, Himmotthan, Appropriate Technology India, Sanjeevani, to mention a few. The successful models should be scaled up and adopted by the State for benefit of rural communities.

Adaptation to Climate Change: Given the challenges the State may face due to growing climate change concerns, the State policy as well as the Vision documents should prioritise public led climate adaptation. There should be an initiative to collect viable, locale specific strategies and identify traditional and low cost practices, easy to understand and implement.

Usage of Insurance Products: It has been widely believed that poor uptake of insurance is due to inability of the farmer household to pay for the premium. However, despite substantial subsidy, the penetration of the PMFBY is poor in the State. A closer introspection of the situation would reveal that people in the hill districts misunderstand "insurance" as a financial risk

transfer product. The perceived distinction between insurance and investment products is blurred. Even with limited knowledge, those who subscribe to insurance policies either do it because of its mandatory feature (while taking any loans for agricultural purposes) or end up having "low insurance". Limited knowledge regarding the working of insurance products (largely understood as insurance for vehicles and lives) and poor network of insurance offices or facilitation centres, are causes of poor uptake of the same. The State therefore needs to publicise the potential benefits of insurance and consider subsidising such products. Apart from the fully modified and restructured PMFBY, there is need of farm income insurance (agriculture and horticulture crops), livestock insurance, insurance of agri-products being transported to the *mandis* in the plains and disaster insurance.

Disaster Mitigation and Risk Coverage: It is to be noted that forest fires (that have increased in recent years affecting both forested areas and also livelihoods and habitats in proximity) have no mention in the policy. Promotion of community involvement in prevention of fires is called for. "No Smoke in The Valley Awards" may be instituted for Gram Panchayats. Orchards can be affected; tea plantations may suffer, due to such disasters. Similarly, animal attack on farmland is another serious concern in the State receiving limited attention. Although there are policies helping farmers to protect crops from animals by building fences, but due to scattered ownership of land, especially in the hills, such strategies may not work. In Himachal Pradesh, for example, they have electric fences to keep away wild animals. However, the incidence of animal attack or damage is growing due to increased human-animal conflicts and interactions.

Adoption of Best Practices: Good agricultural policies need to be either incorporated or redesigned to suit local conditions. It is time that the State government critically analyses the reasons behind success of farm policies and schemes outside the State (such as in Uttar Pradesh, Himachal Pradesh and the North Eastern States) and explore the problems that led to failure of certain programmes within the State. The policy, vision documents and development report should duly acknowledge the prospects of agriculture and allied activities.

Improving Cropping Area and Cropping Pattern: The Industrial policy in the State has led to a conducive environment for development of MSMEs and agro-processing units. The falling trend of area under production/cultivation of many important crops would be an unacceptable scenario for these enterprises in the long run. The State needs to push for the first mover advantage and therefore focus on addressing the deteriorating cropping pattern. It is widely suggested in literature that to mitigate vulnerability to climate change and ensure livelihoods, there should be diversification and shift in the cropping pattern. For example, water stressed areas should avoid growing paddy and water abundant or surplus regions may focus on growing water intensive crops such as sugar cane.

Shift to Horticulture: Conversion to horticulture crops is also proposed because monetary rewards from engaging in such activities are higher than traditional crops. However, such conversions should be based upon rationally taken decisions that are backed by sufficient technological and scientific knowledge. Such steps, in the near short-term would enhance the income of the farming households.

Value from Agricultural Waste: In recent times, burning of agricultural wastes have been identified as a major contributor to the problems of climate change. At the same time, there are available technological solutions to such problems. Such as, use of the husk from the farms for electricity production. Post-harvest value creation or addition of agricultural waste is an untouched area.

Promotion of Strong Farmers' Cooperatives: The farmers in the hill districts, with smaller landholdings, poor infrastructure for inputs, uncertain transportation, limited accessibility, and lack of storage facilities, considered agriculture and the associated output only for selfconsumption. It is difficult to have land consolidation in the hills and therefore initiatives through cooperatives may help revival of hill agriculture and make it more market oriented. The State Institutions have been playing an important role in reducing production risks, there are organisations with support of the State, acting as intermediaries to lower price risks, transportation damage and in the process are also providing alternative livelihood (such as opportunities in cold storage, agro-processing units, etc.).

Promotion of Organic Farming and Marketing of Organic Produce: Finally, it is time the State recognises the changing lifestyle of the people and the growing demand for organic products and emphasises on creation of a brand to promote the State produce. The four key departments responsible for the growth of the primary sector should support this activity to make the sector a major contributor to the Uttarakhand Gross State Domestic Product

Table 4.1: Classification of Total Geographical Area (in lakh. Hectares)

Classification	2010-11	2014-15	2018-19
Forest Area	34.85	38	38.12
Barren and Unculturable land	2.25	2.28	2.49
Land non-agricultural uses	2.18	2.24	1.86
Culturable Waste Land	3.10	3.17	3.24
Permanent Pastures & Other Grazing Land	1.99	1.92	2.08
Land under Misc., Tree Crops and Groves	3.86	3.88	3.94
Current Fallow	0.43	0.57	0.73
Fallow land other than Current Fallow	0.84	0.86	0.86
Net Area Sown	7.23	7	6.72
Total Reported Area	**56.73**	**59.93**	**60.04**
Area sown more than once	4.47	3.97	3.87

Source: Directorate of Economics and Statistics Uttarakhand

Table 4.2: Population Engaged with Agricultural activities

	Census 2001					Census 2011			
	(in percentage)								
State / UT	TW to TP	(C+AL+PE) to TW	Cultivators (C) to TW	Agricultural labourers (AL) to TW	Plantation Etc. (PE) to TW	TW to TP	(C+AL) to TW	Cultivators (C) to TW	Agricultural labourers (AL) to TW
India									
Persons	30.39	17.25	33.15	20.31	3.29	33.24	19.34	31.7	26.5
Males	45.09	23.68	32.62	17.14	2.78	44.09	22.89	31.1	20.8
Females	14.65	10.35	34.89	30.78	4.98	21.69	15.58	32.9	38.9
Uttaranchal									
Persons	27.48	15.02	45.77	6.11	2.77	30.98	18.09	50.1	8.3
Males	38.09	16.08	32.23	7.45	2.54	38.73	16.97	34.3	9.5
Females	16.45	13.91	78.37	2.90	3.31	22.93	19.24	77.8	6.1
Himachal Pradesh									
Persons	32.21	18.95	55.64	1.85	1.37	43.64	29.88	65.3	3.1
Males	43.06	20.18	43.53	1.99	1.34	48.55	25.62	49.5	3.3
Females	21.00	17.69	81.28	1.54	1.43	38.60	34.27	85.8	2.9

Complied by author using information from Census 2001 and Census 2011

Table 4.3: Distribution of Land Holdings

		Number				Area				Average Size			
		(in '000)				(in '000 hectares)				(Hectares)			
		2000-01	*2005-06*	*2010-11*	*2015-16*	*2000-01*	*2005-06*	*2010-11*	*2015-16*	*2000-01*	*2005-06*	*2010-11*	*2015-16*
Marginal	All India	75407.77	83694.37	92825.98	99858.00	29814.47	32025.97	35908.26	37960.00	0.40	0.38	0.39	0.38
	HP	614.94	636.62	670.43	712.00	251.77	258.25	273.27	285.00	0.41	0.41	0.41	0.40
	UK	628.27	658.21	672.14	659.00	242.51	260.30	295.56	283.00	0.39	0.40	0.44	0.43
Small	All India	22694.77	23929.63	24779.15	25777.00	32139.49	33100.79	35244.06	36435.00	1.42	1.38	1.42	1.41
	HP	174.23	175.65	174.60	173.00	244.63	244.74	243.94	242.00	1.40	1.39	1.40	1.40
	UK	158.40	162.88	157.33	149.00	220.73	226.41	225.12	206.00	1.39	1.39	1.43	1.39
Semi-Medium	All India	14020.97	14127.12	13895.55	13776.00	38193.25	37897.69	37704.79	37168.00	2.72	2.68	2.71	2.70
	HP	89.87	88.45	84.87	82.00	243.32	240.36	230.47	223.00	2.71	2.72	2.72	2.72
	UK	78.41	77.79	64.78	58.00	212.39	210.37	175.38	156.00	2.71	2.70	2.71	2.68
Medium	All India	6577.02	6375.34	5875.02	5485.00	38216.69	36583.40	33827.91	31367.00	5.81	5.74	5.76	5.72
	HP	30.90	29.14	27.61	26.00	175.88	165.00	156.46	146.00	5.69	5.66	5.67	5.64
	UK	24.16	21.37	17.30	14.00	132.20	117.16	94.22	79.00	5.47	5.48	5.45	5.44
Large	All India	1230.49	1095.78	972.76	831.00	21071.61	18715.13	16906.83	14212.00	17.13	17.08	17.38	17.10
	HP	3.97	3.53	3.27	3.00	63.16	60.01	50.51	47.00	15.91	17.00	15.45	15.85
	UK	1.42	1.30	1.10	1.00	35.63	32.77	25.40	23.00	25.08	25.13	23.11	26.22

Source: Agriculture Census 2000-01, 2005-06, 2010-11 and 2015-16

Table 4.4: District Level Land Distribution in Uttarakhand

	Below 1.0	1.0-2.0	2.0-4.0	4.0-10.0	10.0 - Above	Total	% change
	Marginal	Small	Semi-Medium	Medium	Large		
	1	2	3	4	5	6	7
Uttarkashi	27997	6883	3816	824	16	39536	4.05
Chamoli	33525	7486	3220	665	19	44915	-6.32
Tehri Garhwal	64922	16449	4480	564	18	86433	6.49
Dehradun	49354	7550	4450	1455	111	62920	-8.84
Pauri Garhwal	52999	21746	8022	1600	62	84429	-4.27
Rudraprayag	19159	5980	1769	184	1	27093	-8.86
Pithoragarh	70574	7881	1335	55	1	79846	-0.61
Almora	82043	22451	4570	201	3	109268	-4.10
Nainital	34234	9637	5069	1556	167	50663	-2.63
Bageshwar	48856	4479	503	30	1	53869	-3.01
Champawat	27390	6517	2113	244	10	36274	-2.46
Hills Total	511053	117059	39347	7378	409	675246	-2.57
Haridwar	96548	20058	10630	3131	178	130545	4.84
USNagar	64537	20213	14804	6793	512	106859	2.80
Plains total	161085	40271	25434	9924	690	237404	3.91
Uttarakhand	672138	157330	64781	17302	1099	912650	-0.97

*Data Source: Agricultural Census 2010-11 *Number of operational holdings by Size group and district*

Table 4.5: Area and Production of Major Crops in Uttarakhand

(Area in '000 hectare and Production in '000 tonnes)

		2001-02	2005-06	2010-11	2014-15	2015-16	2016-17	2017-18	2018-19
Area	Cereals	950	919	895	818	812	816	777	776
	Pulses	30	51	54	57	55	61	65	60
	Total Foodgrains	980	970	948	875	867	877	841	836
	Oilseeds	25	32	24	28	28	28	29	29
	Vegetables	94	73	86	101	90	91	100	97
	Sugarcane	126	108	102	101	96	93	90	91
Production	Cereals	1689	1506	1737	1566	1711	1821	1804	1822
	Pulses	19	28	46	57	46	51	56	55
	Total Foodgrains	1708	1534	1783	1623	1756	1872	1860	1878
	Oilseeds	18	28	25	26	30	26	26	28
	Vegetables	737	912	1031	1110	945	945	989	994
	Sugarcane	7555	6636	6235	6109	5656	5505	6304	6346

Source: Date for 2001-02 collected from the Directorate of Economics and Statistics, Dept. of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture, Govt. of India; Date on "vegetables" for 2005-06 collected from the Indian Horticulture Database , National Horticulture Board(NHB); DES, Uttarakhand and Directorate of Agriculture and the Department of Horticulture, Uttarakhand

Table 4 .6: District-Wise Compound Growth Rates for Horticultural Crops (period 2015-16 to 2018-19)

	Fruits		Vegetables		Potato		Spices		Flowers		
Districts	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Spike/ Cutflower	Prod.
Nainital	0.36	-0.07	0.14	0.33	0.13	0.12	0.26	0.37	3.39	2.65	2.87
UdhamSinghN	1.10	0.15	2.52	1.73	0.10	0.31	1.57	0.99	6.94	2.01	62.98
Almora	0.14	0.16	0.93	0.86	0.28	0.28	1.97	1.22	1.59	3.03	6.01
Bageshwar	0.93	0.18	-0.07	-1.11	0.14	0.15	0.70	0.14	4.33		4.66
Pithoragarh	1.32	1.86	1.46	1.07	0.88	0.19	9.04	3.64	31.42		11.22
Champawat	0.26	0.37	0.62	0.30	0.16	0.04	2.48	1.85	5.32	5.36	6.91
Kumaon Total	0.60	0.30	1.21	0.98	0.26	0.23	2.13	1.26	5.97	2.43	23.50
Dehradoon	0.82	1.50	5.32	1.17	1.21	1.06	2.24	1.87	2.95	2.83	2.51
Pauri Garhwal	0.82	1.36	0.60	7.31	0.76	**2.51**	2.69	10.83	0.85	2.21	4.91
Tehri Garhwal	0.06	0.16	0.10	-3.49	0.06	0.05	-2.89	0.13	9.80		7.62
Chamoli	**3.53**	-4.17	1.15	0.22	0.92	0.53	2.73	0.55	12.79		9.19
Rudraprayag	0.91	1.21	1.61	0.71	0.28	1.35	1.42	0.55	3.68	**213.19**	3.87
Uttarkashi	0.84	-2.75	**9.85**	-0.23	**1.28**	0.36	**21.73**	**14.81**	**51.92**		**516.05**
Haridwar	1.05	0.39	0.55	**9.52**	0.67	0.34	3.49	2.67	0.71	4.82	18.65
Garhwal Total	0.81	0.06	3.61	2.57	0.83	0.59	3.57	3.04	3.63	8.32	12.72
Total	0.72	0.21	2.59	1.78	0.54	0.39	2.96	2.22	4.01	6.08	14.62

Calculated using data from the Horticulture Department, Govt. of Uttarakhand.

Table 4.7.1:Species-Wise Livestock Population (as on 2019)

Sl. No.	Species	Population (Lakhs)				
		1996	2003	2007	2012	2019
1	Cattle	20.31	21.88	22.35	20.06	22.83
2	Buffalo	10.94	12.28	12.19	9.88	9.39
3	Sheep	3.12	2.96	2.9	3.69	2.85
4	Goat	10.85	11.58	13.35	13.67	13.71
5	Horse/ Pony/ Mule/ Donkey	0.24	0.4	0.41	0.45	0.34
6	Pig	0.31	0.33	0.2	0.2	0.18
7	Others (Yak/ Elephant/ Dog/ Rabbit)	0.34	2.73	2.6	2.27	2.35
8	Poultry	9.82	19.84	26.02	46.42	50.19
	Total	55.93	72	80.02	96.64	101.84

Source: 1996: 16th Livestock Census; 2003: 17th Livestock Census; 2007: 18th Livestock Census; 2012: 19th Livestock Census & 2019: 20th Livestock Census

Table 4.7.2: Livestock Production in Uttarakhand

	Unit	2007-0	2008-0	2009-1	2010-1	2011-1	2012-1	2013-1	2014-1	2015-1	2016-1	2017-1
Milk Giving Animals		**Milk Production per day (in Kg)**										
Cow	Per day	2.69	2.94	2.96	2.97	3.11	3.09	3.19	3.64	3.97	4.10	4.25
Buffalo	in Kg.	4.11	4.12	4.10	4.10	4.13	4.15	4.18	4.29	4.50	4.56	4.61
Egg - Per Hen-per year	Number	195	198	197	197	199	208	215	218	213	219	219
Wool -per sheep per year	In kg	1.32	1.34	1.38	1.42	1.45	1.45	1.46	1.52	1.50	1.51	1.52
Meat												
Belonging to buffalo descen	in Kg	125.08	125.23	124.97	124.77	125.11	124.78	123.72	124.45	123.42	123.36	123.44
Sheep		15.25	14.99	15.10	15.24	15.21	15.27	15.33	15.65	15.37	15.39	15.38
Goat		14.77	14.68	14.74	14.86	14.89	14.99	14.92	15.00	15.13	15.26	15.28
Pig		47.55	47.56	47.41	46.71	46.60	46.28	46.17	46.79	46.31	46.66	46.77

Source: Directorate of Economics and Statistics (Various issues) Statistical Diary

Table 4.8: Information on Fisheries in Uttarakhand

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
No of Fisheries Centre	12	12	11	10	10	10	10	10	10	12	12
No of Fisheries Development Agency	1	1	1	1	1	1	1	1	1	1	1
Fish Production (000' MT)	3.091	3.163	3.488	3.818	3.883	3.889	3.936	4.02	4.137	4.297	4.578
Value of Production (in Million Rs.)	129.82	142.33	221.99	221.99	347.94	395.03	439.25	468.69	486.03	535.19	590.52
Fisheries seed production	374.21	383.24	344.83	439.43	414.53	428.31	444.27	485.71	628.97	746.88	678.8

Source: Directorate of Economics and Statistics (Various issues) Statistical Diary

Table 4.9: Targets and Achievements of Physical progress – Cooperatives Department, Govt. of Uttarakhand

Name of the Scheme/Article	Unit	FY 2015-16		FY 2016-17		FY 2017-18		FY 2018-19		FY 2019-20	
		Target	Achieved (Upto Feb 2016)	Target	Achieved (Upto Mar 2017)	Target	Achieved (Upto Feb 2018)	Target	Achieved (Upto Jan 2019)	Target	Achieved (Upto Feb 2020)
1- Cooperative Credit and Surplus Scheme											
Short-term credit distribution	Rs. In Lakh	113440	80941	116235	82143	116235	90143	116235	85362	139000	99955
Medium-term credit distribution	Rs. In Lakh	8400	2182	8400	2451	8400	4156	8400	5354	28000	10150
Deen Dayal Co-operatives Farmer Welfare Scheme	Rs. In Lakh	55850	79842	0	72970	30850	95076	74692	47741	82270	55894
Membership growth	Nos.	42000	17551	42000	16089	100000	49473	100000	28215	100000	26687
Growth in contribution by members	Rs. In Lakh	1240	835	1357	580	1357	741	1357	788.71	1530	869
2- Co-operatives Sale-Purchase Scheme											
Seed distribution	Quintal	16000	2039	16000	663.4	16000	0	16000	35772	102870	15820
Sale of agricultural produced	Rs. In Lakh	1110	0	1110	23	1110	0	1110	0	1110	20550
Purchase of wheat	MT Ton	110000	3786	110000	2160	110000	2041	130000	68811	130000	31636
Purchase of paddy	MT Ton	40000	53198	60000	49574	60000	36044	60000	58222	70000	88012
3- Consumer Scheme-											
Urban area	Rs. In Lakh	6366	4170	7385	6156	7775	4844	7880	5359	9580	3859
Rural area	Rs. In Lakh	5245	2601	5695	2786	5695	2564	6100	1753	6100	2770
4- State help on fertilisers transportation in hilly areas											
Chemical fertilizers distribution	MT Ton	183540	118782	189100	136703	189100	116303	189100	140257	205300	114708

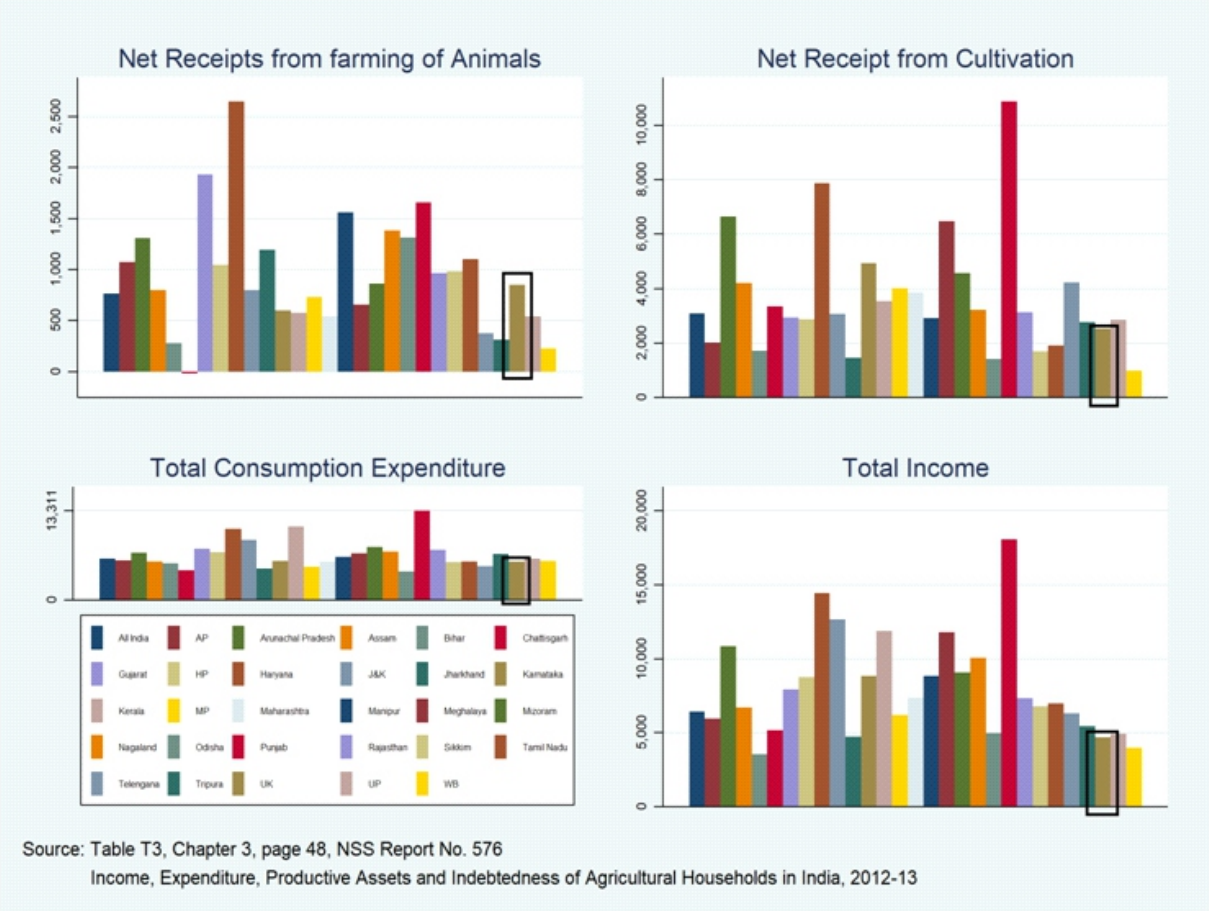
Source: Directorate of Economics and Statistics (Various issues) Statistical Diary

Table 4.10: Physical and Financial Targets and Achievements – "Per drop more crop MI" in Uttarakhand

Year	Target						Achievement					
	Physical			Financial			Physical			Financial		
	Drip	Sprinkler	Total	Drip	Sprinkler	Total	Drip	Sprinkler	Total	Drip	Sprinkler	Total
2015-16	659.60	292.80	952.40	167.95	79.76	247.71	614.20	289.40	903.60	159.69	86.83	246.52
2016-17	2108.10	1148.70	3256.80	529.19	398.56	927.75	2238.60	960.40	3199.00	508.99	286.26	795.25
2017-18	2015.80	1776.20	3792.00	563.18	532.24	1095.42	1215.60	970.60	2186.20	322.86	186.83	509.69
2018-19	2900.40	2557.60	5458.00	860.06	743.88	1603.94	2244.41	2011.60	4256.01	698.20	527.88	1226.08
2019-20	3173.20	2388.40	5561.60	935.67	763.01	1698.68	3877.16	2818.92	6696.08	1073.90	892.72	1966.60
Crops requiring Drip												
Sugarcane, Aonla/Amla, Apple, Apricot, Guava, Kiwi, Lime/Lemon/Citrus, Litchi, Mango, Papaya, Peach, Pear, Plum, Pomegranate, Walnut												
Crops requiring sprinklers												
French Beans, Brinjal, Cabbage, Capsicum, Cauliflower, Green Chillies, Leafy Vegetables, Onion, Peas, Potato, Radish, Tomato												

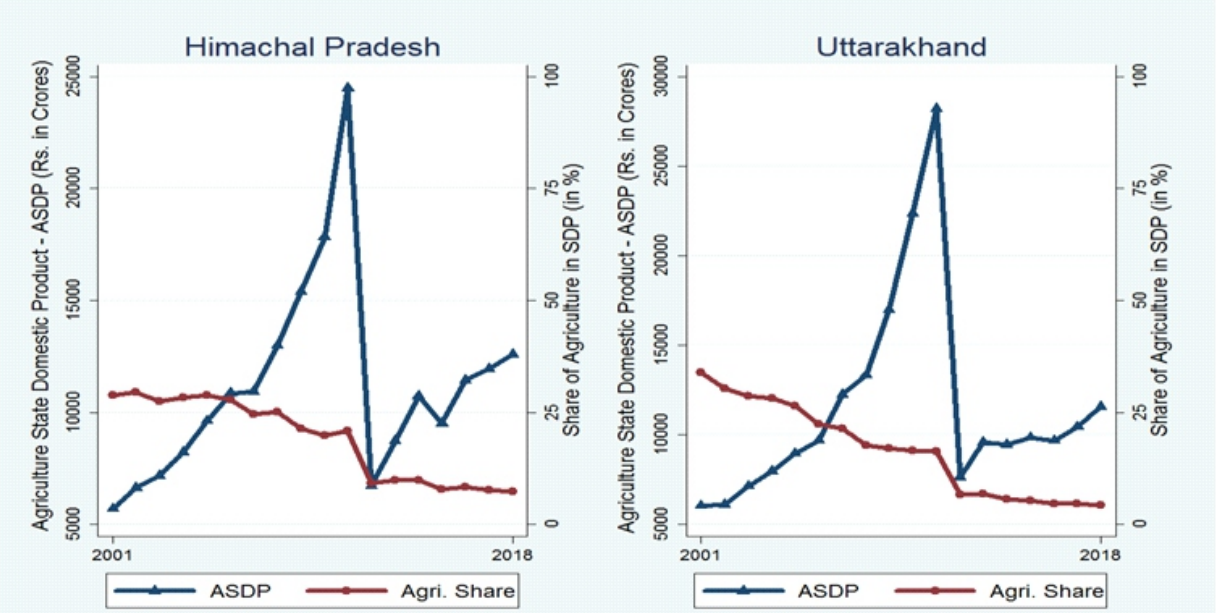
Note: Physical Target is Area in hectares and Financial Target is Rs. In lakhs
Source: Compiled from information available at https://pmksy.gov.in/microirrigation/Reports.aspx (Accessed on 2nd April 2020)

Figure4.1: Income & Expenditure of Farming Households – State Wise Classification -2012-13



Source: Table T3, Chapter 3, page 48, NSS Report No. 576
Income, Expenditure, Productive Assets and Indebtedness of Agricultural Households in India, 2012-13

Figure4.2: Contribution of Agricultural Sector to State Gross Domestic Product: Himachal Pradesh and Uttarakhand



Author's calculations; SDP is State Domestic Product; ASDP and SDP are in constant 2011-12 prices.
Data Source: RBI, Handbook of Statistics on Indian States

Figure4.3: Area, Production and Yield Trends for Foodgrains and Horticulture – All India, Himachal Pradesh and Uttarakhand

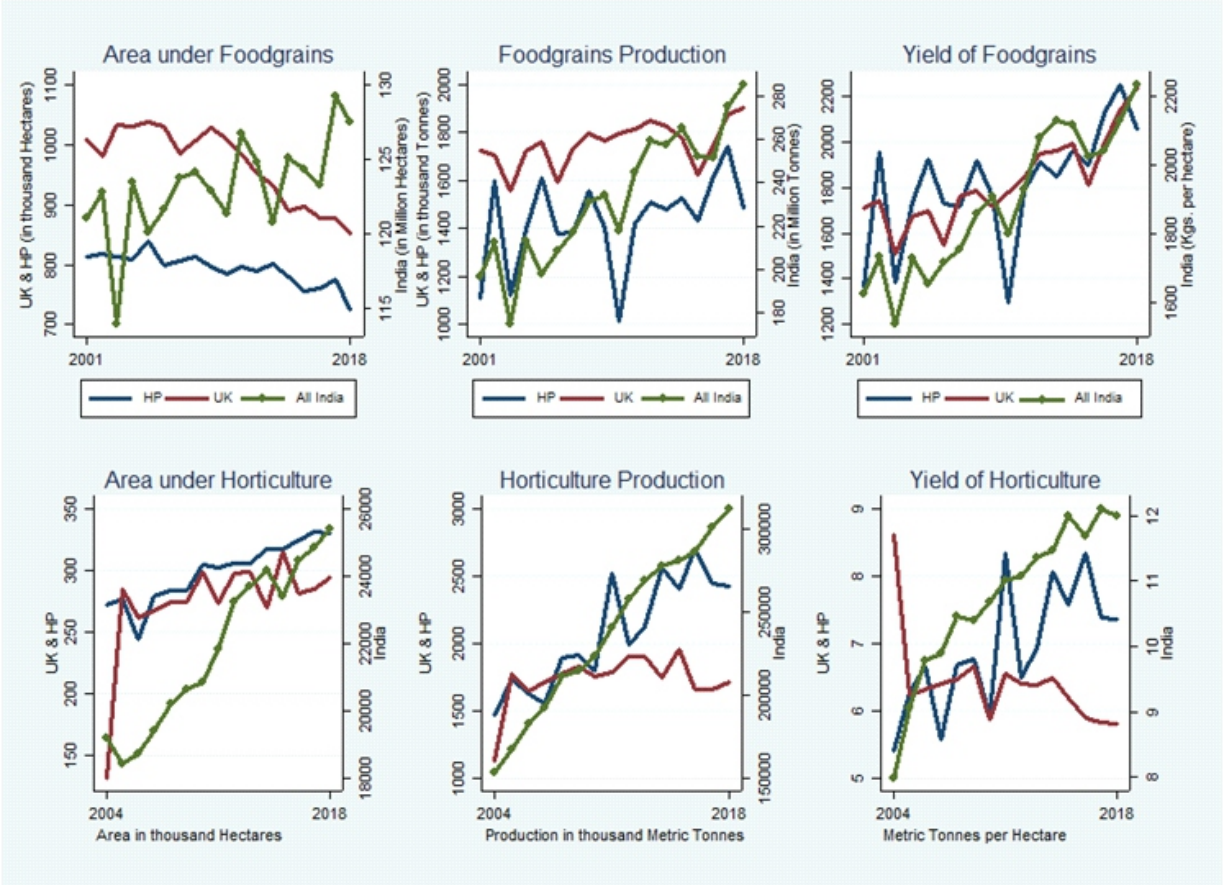
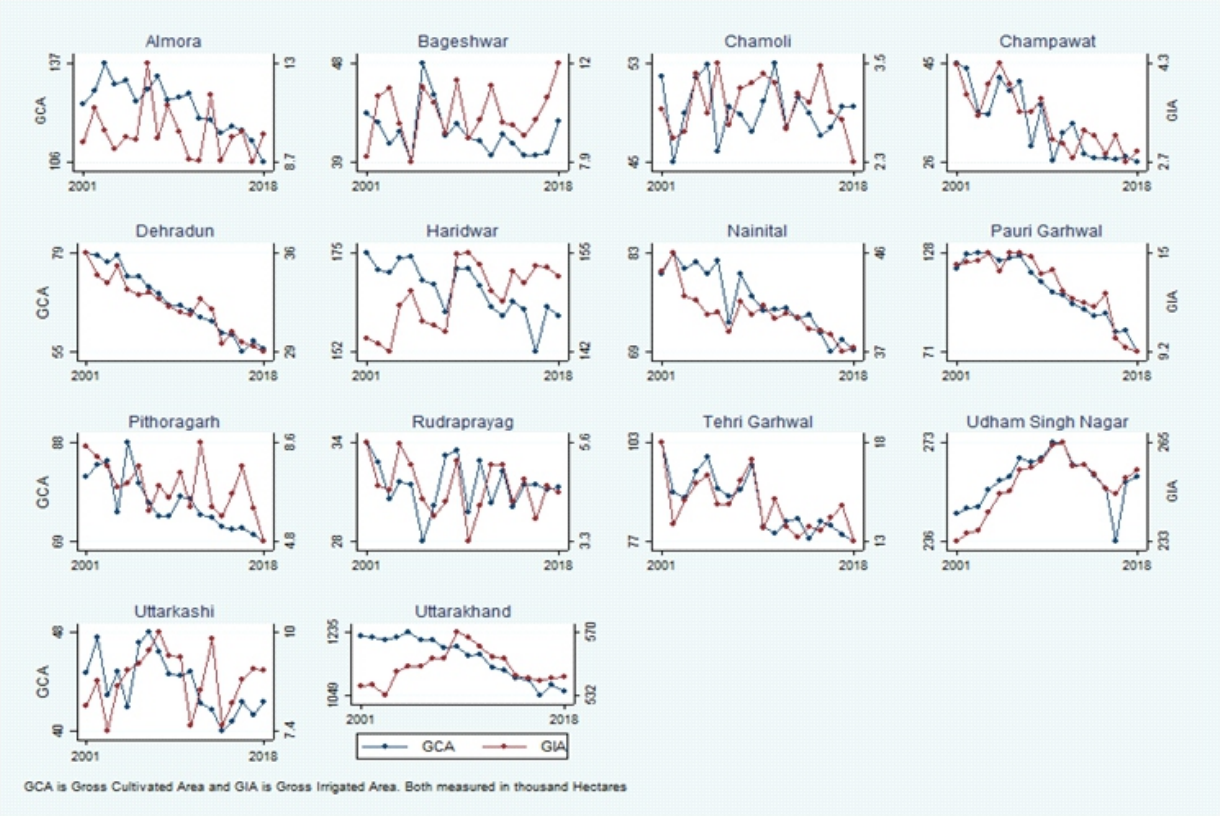
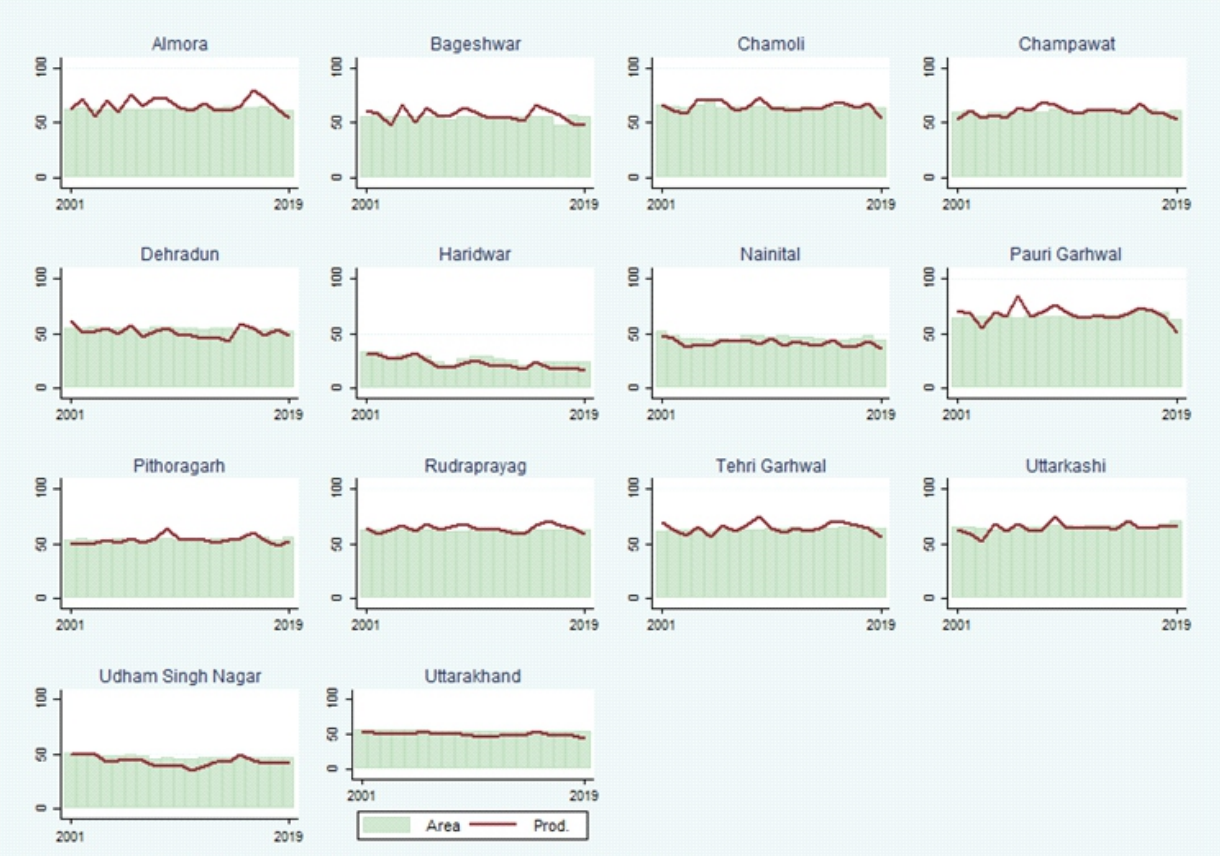


Figure4.4: Districtwise Gross Cropped Area and Gross Irrigated Area in Uttarakhand



GCA is Gross Cultivated Area and GIA is Gross Irrigated Area. Both measured in thousand Hectares

Figure4.5: Districtwise Share of Total Area and Total Production of Kharif Crops in Uttarakhand



The y-axis represent Share of Kharif area and production under food production to total figures in Percentages

Figure4.6: Districtwise Total Production and Yield of Foodgrains in Uttarakhand

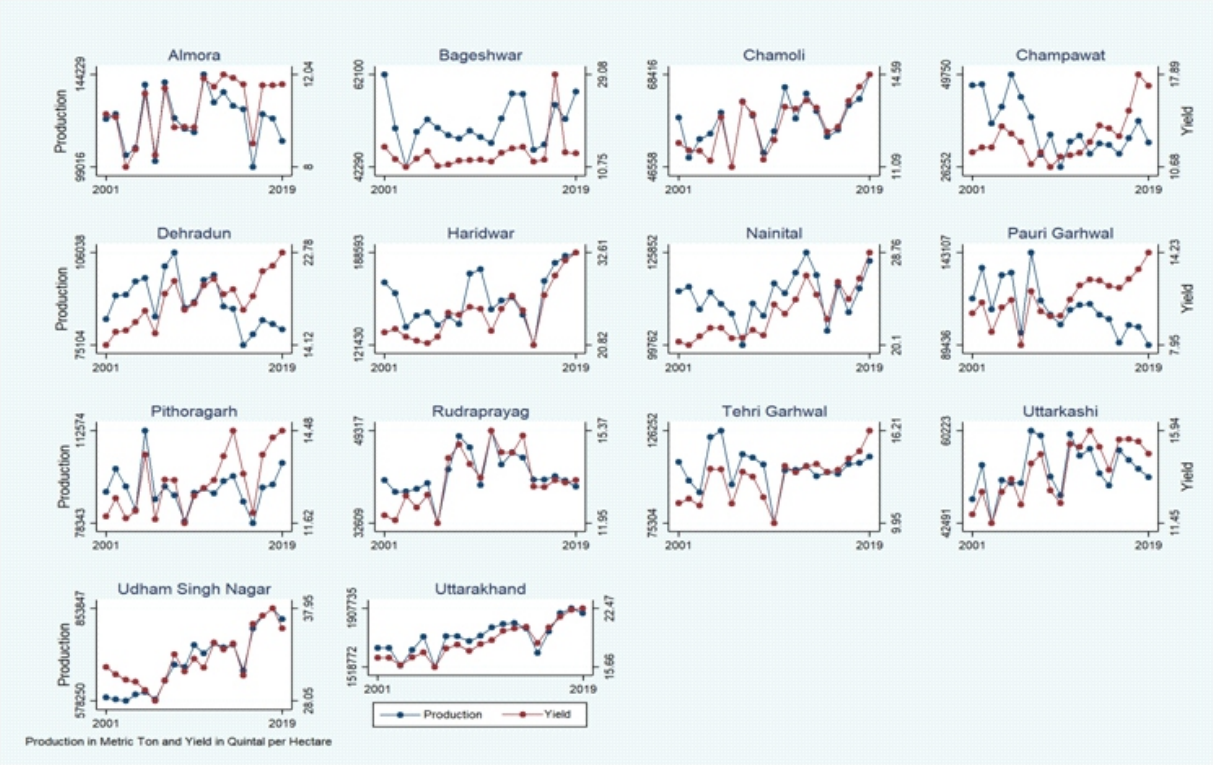
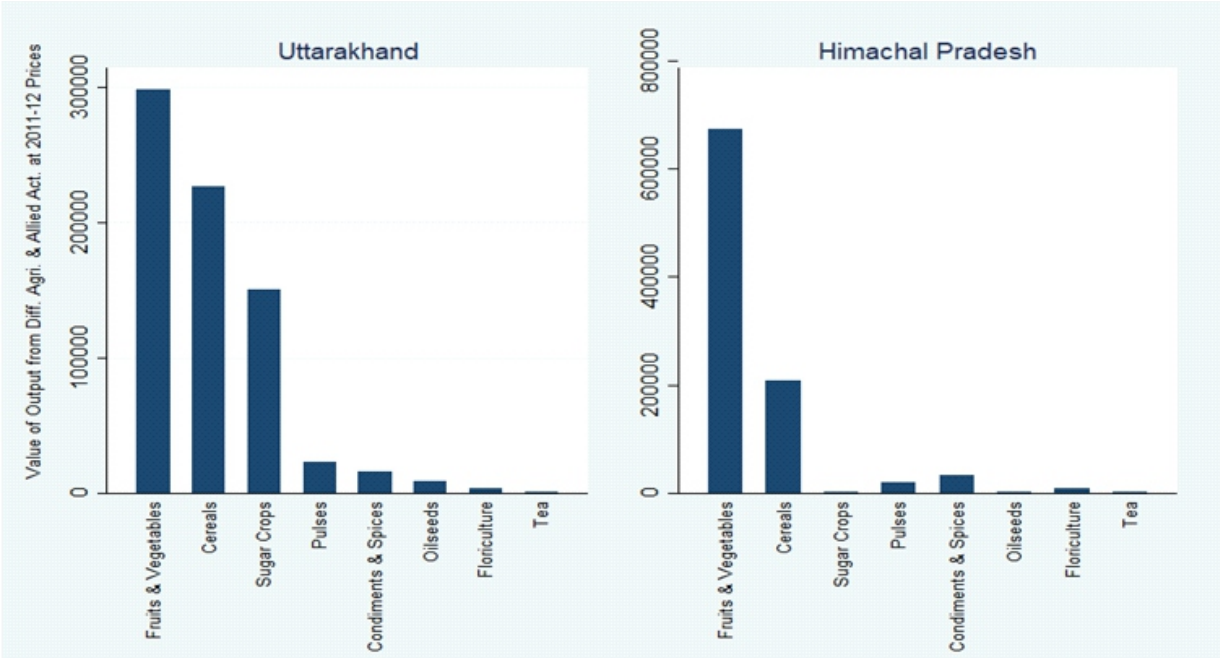
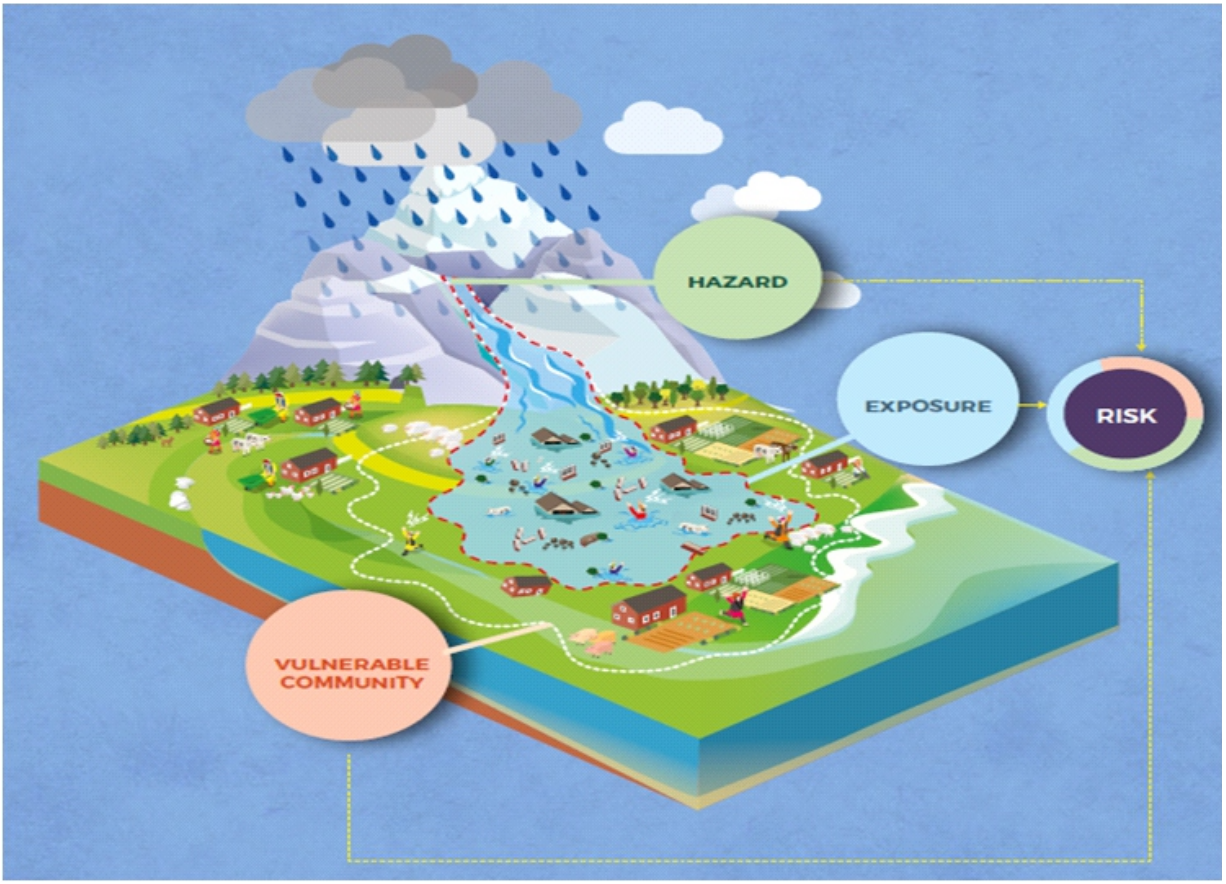


Figure4.7: Value of output of Different Crops in Uttarakhand and Himachal Pradesh in 2015-16



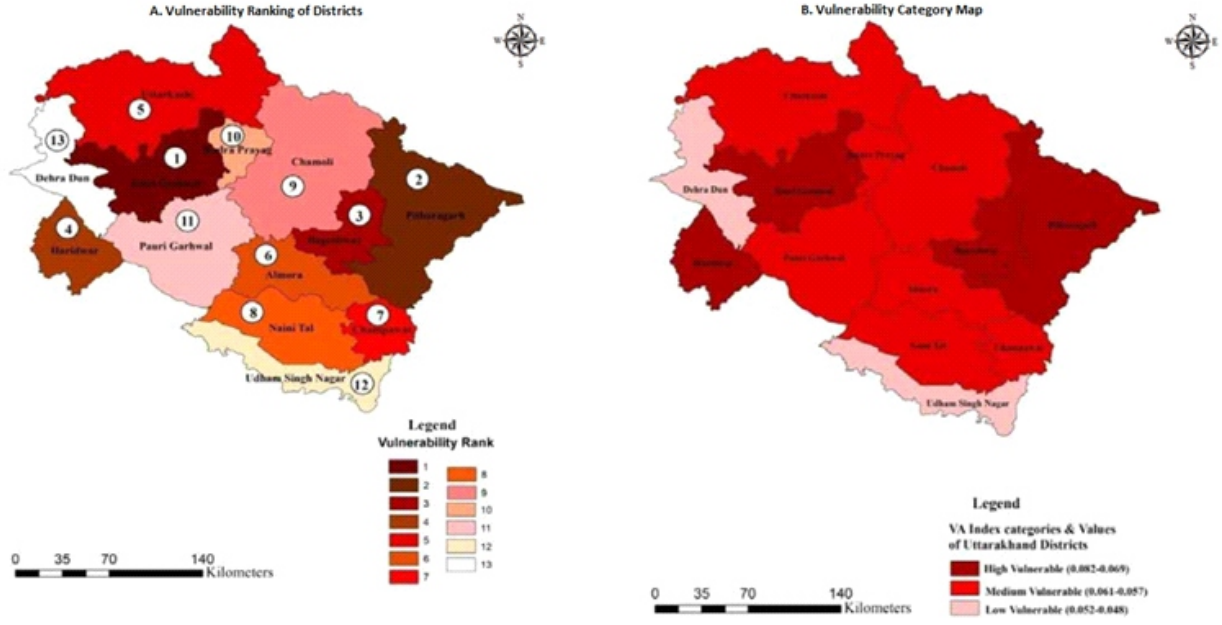
Statewise and Item-wise Estimates of Value of Output from Agriculture and Allied Sectors (2011-12 to 2015-16)
Central Statistical Organisation, MOSPI, GOI:

Figure4.8: Systematic Overview of the Core Components of Hazard, Exposure And Vulnerability Coming Together to Create Risk



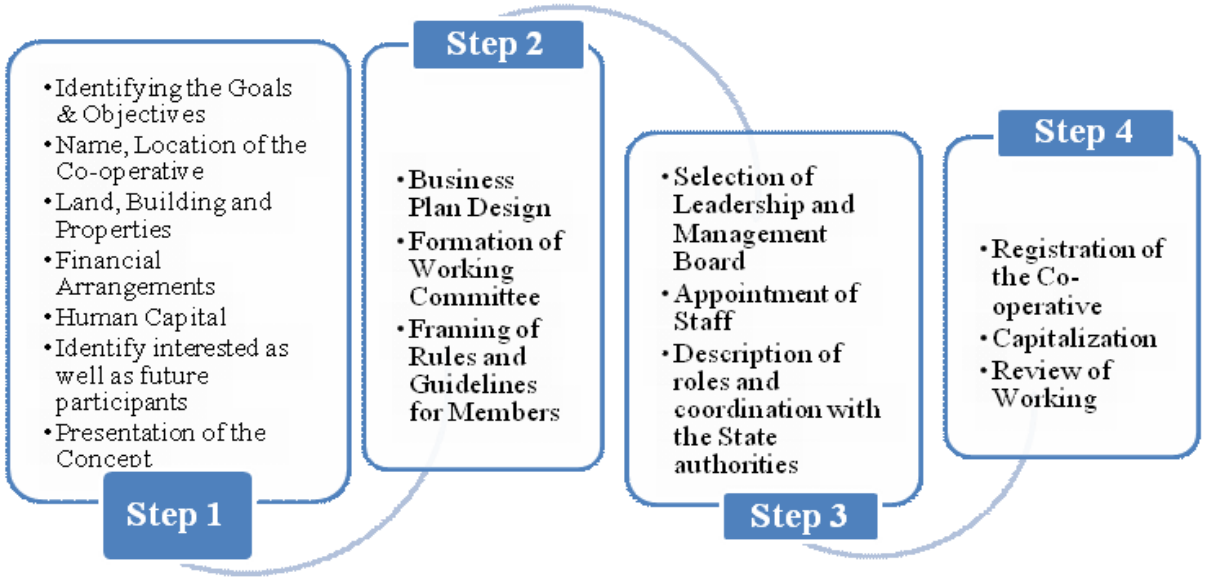
Adopted from: IHCAP (2017) Assessing Climate Vulnerability and Risk in the Indian Himalayan Region, page 3

Figure4.9: Districtwise Vulnerabilty Ranking and Vulnerability Categories in Uttarakhand



Source: Adopted from IHCAP et al. (2019) Climate Vulnerability Assessment for the Indian Himalayan Region Using a Common Framework, page 48

Figure 4.10: Steps Towards Forming a Co-operative



Compiled by author based on "How to Set Up a Farmer's Co-operative in Nigeria" (Available at: https://probityfarms.com*)*

Table 4.10: Experiences with Organic Farming

S. No.	Area/Location	Type of Govt. Support	Observations
1	Uttarakhand, India	State	- Uttarakhand Organic Commodity Board (UOCB) playing a crucial role - Long term investment projects are needed
2	Sikkim, (Timpyem Village from East Dist.)	State	- Overall yield enhancement by the recommended technological intervention under Integrated Organic farming System (IOFS) was 16.07 percent over the pre-intervention
3	Telangana (Medak Dist) & AP (Kurnool Dist)	State	- Increment in farmers income compared to the regular farming due to reduced input - Farmers are facing market/price risks due to poor marketing
4	Karnataka (Doddadenahalli Village), India	State	- The programme has positive impact on all the developmental parameters due to development of organic villages on the basis of organic farming
5	Nepal (Chamrangbes Village)	Central	- Government support is necessary for organic farming - Certification issue creates hurdles for marginalised farmers.
6	China (Wanzai Jiangxi Province)	Central	- Organic farming contribute to higher farm incomes for small-scale farmers (less than 1 hectare land) compared to those participating in conventional agriculture - Organic agriculture ensures stable & sustainable livelihoods
7	Germany (North Rhine-Westphalia, Hesse and Lower Saxony)	Self	- Majority of organic farmers show pro-environmental orientation - Hypothesis of conventionalization emerged that indicates organic farming is becoming a slightly modified model of conventional agriculture.
8	Denmark (Ribe and Vestsjaelland)	Self	- Only 7% of farmers plan to convert to organic farming - Only beginners initiates and involves in organic farming
9	Uganda	Self	- No specific Government policy on organic agriculture - 85 percent farmers practice organic farming - Limited research, training and education in this area - Certified organic agriculture targets mainly for exports

Source: Compiled by author from selected research articles

Exhibit 4.1: Summary of the Uttarakhand Action Plan on Climate Change

Major Issues and Challenges	*Priorities*	*Strategies*
1. Majority of small, marginal and fragmented land holdings **2. Predominance of rain - fed agriculture** **3. Problem of soil erosion** **4. Limitation of use of farm machinery in hill areas** **5. Inadequate infrastructure in agriculture** **6. Low availability of inputs and access to last-mile conn ectivity for extension services** **7. Vicious cycle low production due to low productivity which is because of low input supply and limited awareness of new technologies and lack of extension support** **8. Reduction in crop genetic diversity** **9. Crop depredation by wildlife** **10. Higher cost of production for agriculture in the hills** **11. Migration and impacts** **12. Most of the land is owned by men but women till the land**	***A. Food &Nutritional Security*** i. Improvement of soil health in plains areas and soil and water conservation in hilly areas ii. Development and extension of farm economic models under the *farming system approach in the organic mode* for small and marginal farmers and market base *diversification of agriculture* iii. Water management iv. Revitalization of rain - fed agriculture v. Promotion of coarse cereals, pulses and oilseeds production, among others ***B. Sustainable agriculture, conservation of biodiversity and environmental security*** i. Promotion of sustainable agriculture ii. Establishment of gene banks to conserve agro-biodiversity iii. Eradication of invasive alien species iv. Documentation of traditional knowledge **C. Agriculture Education and Research** i. Emphasis *on rain-fed farming, floriculture, fisheries, agricultural economics, agricultural management, post-harvest technology, etc.* ii. Short-term courses under formal education system and distance learning system iii. Separate *university of horticulture* and forestry in the state. iv. ICT in agriculture v. Conservation of traditional knowledge	***A. Agriculture & Allied Sectors*** I. Investments in adaptation research capacity ii. Changes in policies iii. Investments in infrastructure for water management and soil conservation iv. Relocation to more productive areas and practices v. Greater insurance coverage for the farming operations vi. Improved information, knowledge base and dissemination of information on climate changes and options to adapt to them vii. Creating alternate livelihood options, etc. **B. Improvement of crops and systems** i. Natural adaptation ii. Genetic adaptation iii. Non-genetic adaptation iv. Crop insurance v. Better support prices and credits vi. Post-harvest storage infrastructure augmentation, food processing, promote apiculture, etc. **C. Capacity Development, Education and Awareness** Village Knowledge Centres (VKCs), appointment of Krishi Mitra. KMs trained in institutions such as GBPUA&T, Pantnagar, Vivekananda Parvatiya Krishi Anusandhan Sansthan (VPKAS), Almora and National Academy of Agricultural Research Management (NAARM), Hyderabad

Source: Compiled from the Govt. of Uttarakhand (2014) Uttarakhand State Action Plan on Climate Change

Exhibit 4.2: Schemes Related to Organic Farming in India

	Scheme	Details	Budgetary Allocation in 2020-21 (In Cr)
1.	Paramparagat Krishi Vikash Yojana (PKVY)	- Organic farming through the adoption of organic village by cluster approach	500
2.	National Project on Organic Farming (NPOF)	- Encourage production and use of organic and biological sources of nutrients such as bio-fertilisers, organic manure, compost for sustained soil health and fertility	12.5
3.	Organic Value Chain Development for North- East Region	- To encourage, facilitate and promote development of organic farming in eight states in the region	175

Exhibit 4.3: Central and State Funded Initiatives in Fishery Development

Central Government Schemes &Policies	State Government Schemes and Policies
• Different components under Blue Revolution Programme • National Fisheries Development Board (NFDB) assisted activities • Rashtriya Krishi Vikas Yojana (RKVY) • National Cooperative Development Corporation (NCDC) • Integrated Livelihood Support Project ILSP • Strengthening of Database & geographical information networking (100% centrally funded)	• MSME Policy 2015 & Mega Industrial & Investment Policy 2015 • Matsya Niyamawali 2013 • ***Fisheries scheme*:** o Schedule/Tribal component sub plan o Fisheries Diversification scheme o Construction of Ideal Fish Ponds in Hilly areas o State fisheries Input scheme • ***Centrally Sponsored***: o Cold water fisheries, o Fresh water aquaculture o Reservoir fisheries – Cage culture o Mission Fingerling o Establishment of hatcheries & feed plant o National Fishermen Welfare Scheme • **NABARD Funded scheme**

Source: Compiled from "https://investuttarakhand.com/themes/backend/investible/IP-UK-Trout%20Farming.pdf

Exhibit 4.4: Key Announcements in the State Budget for the Agriculture and the Allied Sectors

2019-20

1) ***Pradhan Mantri Kisan Samman Nidhi(PM-KISAN)***
- Beneficiaries: Small and Marginal landowner/farmers will get Rs. 6000 per annum
- 90 percent will be benefited and Rs. 450 crore will be transferred to the accounts of farmers through DBT

2) ***The Prime Minister's Crop Insurance Scheme***
- Protect the farmers from crop damage due to various disasters.
- Crops included: *Rice, mandwa and wheat* for the entire state and *masoor, lentil* for Pauri and Pithoragarh

3) ***Pradhan Mantri Krishi Sinchai Scheme***
- Allocation : Rs. 50.50 crore

4) ***National Agricultural Development Scheme***
- Allocation : Rs. 87 Crore

5) ***Sankalp se Siddhi***
- To double the farmers income by 2022
- Allocation: Rs. 100 Crore

6) ***Horticulture Insurance Scheme***
- 50 thousands farmers will be insured
- Allocation: Rs. 20 Crore

7) ***Externally Aided Horticulture Development Project***
- Allocation: Rs. 700 Crore
- Crop wise Value Chain and Excellence Centres will be established under this Scheme

8) **Proposed allocation for Agriculture & Horticulture: Rs. 1341.10 Crore**

9) ***Elite Herd*** is proposed in the State Animal Breeding Farm, Nariyalgaon, Champawat for conservation and promotion of *Badri cow.*

10) **Double the income of fish production** and fishery by the year 2022.

2018-19

1) ***Per Drop More Crop***: for Agricultural Development
- Allocation:20 Crore

2) ***Rashtriya Krishi Vikas Yojana***
- To double the farmers income by 2022

3) ***Ekikrit Adarsh Krishi Gram Yojana***

4) Atal Jadi Buti Mission

5) ***Mission Fingerling***: To enhance the production of fish by constructing new ponds

6) ***Support to State extension programme for extension Reforms***: To provide recent technological information to the farmers
1. *Submission on Agricultural mechanization*: Enhancement of advanced agricultural equipment
2. *Submission on Seed and Planting Material*: Use of high quality seeds
3. *National oil seed and oil palm Mission*: To enhance the production of oilseeds in the state

2017-18

1) To Provide ***Soil Health Card*** for all farmers
2) ***Pradhan Mantra Fasal Bima Yojana*** to compensate crop damage
3) ***Skill Development Scheme*** to train farmers by 2030.
4) National Livestock Mission for animal husbandry
5) ***Pashudhan Bima Yojana*** : Insurance schemes for livestock

2016-17

1) ***Madhav Singh Bhandari Krishi Syebhagita Yojana***
   - To encourage cooperative farming and an expert group shall be formed to develop Border Hill Agriculture
2) 20 villages shall be selected to plant Medicinal Herbs.
3) Horticulture training centre in Ravai Valley in Uttarkashi.
4) Budget provision for Mission Apple Yojana
5) ***Mukhya Mantri uttarakahnd Rajye Van Jivo se Kheti ki Suraksha Yojana*** : To keep wild animals away from damaging crops

2015-16

1) ***Manav-Vanar Sangarsh Neunikaran Yojana***
   - To minimize damage done by monkeys to crops and other losses
2) *Bonus* will be given for production of Madua, Anardana, Fafar and Chaulai
3) One time grant for milk society to establish chilling plants
4) Rs. 198.51 Crore is allocated for dairy and Fisheries

2014-15

1) Cluster based agriculture will be incentivized
2) 10 percent additional gratuitous relief for disaster affected sugarcane growers
3) Land consolidation in hilly districts
4) Incentive to fodder, fruit production and fruit industry in hill districts to strengthen hill economy

Source: Compiled from State Budget notes

Exhibit 4.5: Department-wise Flagship Policies and Schemes in Uttarakhand

Department	Policy/Scheme
Directorate of Agriculture	**1. NMSA - *National Mission for Sustainable Agriculture*** a. RAD – *Rainfed Area Development* in 53 clusters b. PKVY – *Paramparagat Krishi Vikas Yojana* in 12 Districts - Organic farming in 78000 hectares, Rs. 6444.01 lakhs c. SHC – *Soil Health Card Scheme* - Phase 1 (2015-16 to 2016-17): 765410 cards issued - Phase 2 (2017-18 to 2018-19): 687051 cards issued **2. PMKSY - *Pradhan Mantri Krishi Sinchayee Yojana* (90%)** - Per drop more crop Micro irrigation: 2018 -19 - Target 2337 hectares/ achieved 746 hectares (See Table 4.10) - Construction of tanks, check dams, irrigation ponds, etc. - Convergence with MNREGA **3. NFSM - *National Food Security Mission*** **4. RKVY-RAFTAAR - *Remunerative Approaches for Agriculture and Allied Sectors Rejuvenation*** - Focus on infrastructure & promote *Agripreneurship* - 2018-19: Allocated Rs. 1210.22 Lakhs/ 54 projects **5. PMFBY – *Pradhan Mantri Fasal Bima Yojana*** - Kharif 2019: a) Rice & Mandwa: 89962 farmers, 49387.81 hect. b) Seasonal Crops: 47933 farmers, 25591 hect. - Till Dec 2019: 168472 farmers **6. NMAET – *National Mission on Agriculture Extension & Technology*** a. SAME – *Sub Mission on Agricultural Extension* b. SMAM – *Sub Mission on Agricultural Mechanisation* c. SMSP – *Sub Mission for Seed Planting Material* **7. Seed certification** **8. Fertilizer policy** **9. Doubling of Farmers' income** **10. E-NAM – *e-National Agricultural Market***
Department of Horticulture	Policies under "1" as above 2. **NHM - *National Horticulture Mission*** - Establishment of nursery (2 categories: hi -tech and small); Seed production for vegetables and spices; New horticulture units; Expansion of area under vegetables, spices, floriculture and mushroom - Rejuvenation of orchards and nurseries - Water Management: tube wells and construction of ponds

4.2 Transformational Tourism

Abstract

Uttarakhand is a mountain State blessed with rivers and forests. Within this pristine setting, Uttarakhand is referred to as the spiritual sovereign and abode for wellbeing. Tourism in Uttarakhand revolves around its natural heritage. UNWTO, in its 2019 report, has identified travel to 'change' as the key consumer travel trend whereby travellers seek authenticity and transformation. Uttarakhand is well poised to meet this demand primarily with its transformational tourism products- wellness tourism, spiritual tourism, adventure tourism, nature-based tourism, rural tourism etc.

The State has come up with a Vision 2030 document, which outlines its intent to align with UN's Sustainable Development Goals (SDGs) for wholesome and inclusive growth. Tourism along with hydropower are two key economic d*rivers in the State. Tourism is seen as a key enabler for achieving sustainable livelihood goals. The State has a Tourism Policy (2018). This policy accords 'industry' status to tourism, allowing incentives for investors in this sector. The policy also lays down the roadmap for the ambitious '13 districts 13 destinations' scheme. The policy has also been aligned to the Uttarakhand Skill Development Mission for capacity building and skilling of the community to serve the sector and thereby create meaningful employment.*

However, Uttarakhand tourism will require strategic and tactical interventions to offset the challenges posed by overtourism, issues of sustainability in a fragile ecosystem, capacity building, migration of rural population, insufficient coordination among departments related to the development of tourism, access of visitors to protected areas, etc.

4.2.1 Introduction

The State of Uttarakhand has committed itself to align with the United Nations General Assembly 2030 Agenda for Sustainable Development. The agenda is a plan of action for people, prosperity, peace, partnership and planet that furthers universal peace in larger freedom. It has laid out 17 Sustainable Development Goals (SDGs). The leadership of the State has resolved that endeavors of growth would be inclusive and sustainable. This resolve is rolled out in the **Vision 2030** for the State of Uttarakhand. The Vision Document outlines the mountain State's trajectory for sustainable development. It seeks a delicate equilibrium between the human activities required to usher in prosperity for people on the one hand; and its pristine natural environment on the other hand. The State of Uttarakhand is blessed with mountains, rivers, forests, wildlife and an image of a spiritual destination.

Vision 2030: Transform the Uttarakhand economy into a prosperous, healthy state such that the people are educated and gainfully employed in an equitable society, the synergy between the environment and the inhabitants is enhanced, and the development process is sustainable and inclusive.

The framework for Vision Document for Uttarakhand uses four thematic categories to organize 15 SDGs. These four thematic categories are Sustainable Livelihoods (SDGs 1,2,8 and 9), Human Development (SDGs 3, 4 and 6), Social Development (5, 10, and 16), and Environmental Sustainability (SDGs 7,11,12,13 and 15). SDG 14 relating to 'Life Below Water' was considered not applicable to the State. SDG 17 refers to 'Strengthen the Means of Implementation and Revitalize the Global Partnership for Sustainable Development' and is largely applicable at the country level.

Uttarakhand is one of the fastest-growing State economies in India. Owing to supportive industrial policy and tax regime, the State has attracted huge capital investments. According to IBEF, between 2011-12 and 2018-19AE, Gross State Domestic Product (GSDP) expanded at a Compound Annual Growth Rate (CAGR) of 10.85 % to Rs 2.37 trillion (US$ 32.87 billion) whereas the Net State Domestic Product (NSDP) expanded at a CAGR of 11.06 % to Rs 2.12 trillion

(US$ 29.44 billion). State also envisages being developed as an 'energy State' to tap the hydropower electric potential of over 25,000 MW. As of July 2019, the State had a total installed power generation capacity of 3410.84 MW.

4.2.2 Enablers in Uttarakhand Economy

Uttarakhand has several factors that strengthen its economy and help in the further development of the State. Firstly, Uttarakhand has a high economic growth rate and per capita income. Uttarakhand also enjoys good social and human development indicators such as sex ratio and educational attainment. Apart from this, the poverty rate is extremely low in comparison to other States, which is 11% (as of 2011–12) with very little rural-urban difference. There is an absence of severe hunger problems, and it is a peaceful State.

4.2.3 Role of Tourism

Tourism is also considered as a key driver of development in the State. Uttarakhand is a known religious and wildlife tourism destination. In 2017, the State recorded around 34.36 million domestic visitations while there were more than 0.13 million Foreign Tourist Arrivals (FTAs), which accounted for 2.08% and 0.05% of the market shares respectively (Source: Indian Tourism Statistics 2018, MoT). The State's vision document has set an ambitious goal to make Uttarakhand as one of the top 10 tourism destination States of the country by 2020, up from its present rank of 12, to acquire a place among the top 5 destination States by 2024, and finally to attain a position among the top 3 destination States by 2030.

Subsequently, the State has come out with the Uttarakhand **Tourism Policy 2018**. Uttarakhand Tourism Policy, 2018 is a revised policy, which aims at developing the State's image as a safe, secure and friendly destination for tourists. It accords 'industry' status to tourism, thereby creating investment opportunity for investors through favourable incentives, subsidies & provisions. It envisages tourism as a major source of employment and revenue generation in the State. Further, the policy focuses on developing emerging Tourism offerings such as balloons ,caravans, homestays, ropeways, golf, as well as winter destinations to make the State a global, 'all-season' destination. The Chief Minister has noted that during 2006-07 to 2016-17, the tourism sector accounted for a large share in the State's GSDP. Tourism, therefore, has an important role in Uttarakhand's journey towards realising its socio-economic targets. Tourism has the potential to contribute to attaining the identified 15 SDGs. However, a cursory look at the Vision Document reveals that the contribution of tourism is correlated strongly to realising sustainable livelihoods. There is only a passing reference to tourism as an enabler for the other three thematic groups.

The tourism brand of a place should not be different from the personality of the place. Uttarakhand has a personality of its own. The entire business of the State must be in sync with the place. This approach includes tourism and efforts of the State to create an image and tourism products, which are in line with the personality of the State. This principle applies to non-tourism businesses also. A place's image has three aspects. The first is the *organic image* of the place, which has evolved over a period owing to its geography, topology, history, society, culture, polity, legacy, etc. This image is also reinforced through the general awareness of the place through media coverage, books, movies, blogs, word-of-mouth, etc. The second dimension is *marketing induced image*. It is based on the tourism products that are offered and the promotional campaign, which includes advertising, social media, PR efforts, logos, slogans, taglines, etc. The third dimension is the *experiential* phase. This image is what the visitors experience when they arrive at the destination. Do they experience what was promised and believed about the place or is it different? The farther the experience is from the image the more blurred image of the place is formed, which makes it difficult for the visitors (customers) to differentiate it from the competition. Unless the State of Uttarakhand creates a perceived value differential in the minds of its potential customers, including the stakeholders, it will be difficult for the State to have a sustainable competitive advantage in the longer run.

Uttarakhand is endowed with pristine nature-mountains, rivers, forests, wildlife, etc. Over thousands of years for the locals and the visitors this has reverberated as a destination for spiritual abode. Of late visitors from urban clusters and from outside of the country, Uttarakhand has been a destination for transformation through non-religious spiritualism and corroborating activities. The tourism-related challenge for the State of Uttarakhand is to reinforce this 'idea of the place'. The whole exercise of strategy formulation and delivery is about painting a clear picture (as against a dull and blurred picture). All animate and inanimate elements at a destination must convey a meaning that converges with a destination's personality. Sharper the convergence the clearer the image is. Destinations that tend to offer many thingsoften end up creating a blurred image of the place and confuse their potential visitors.

The covid19 situation created panic for several businesses, but tourism is among the most affected sector. Lockdown and restriction on mobility have paralysed the tourism industry. Immediate measures are required to position Uttarakhand as a safe destination for eco-tourism, immunity boosting, wellness yoga centers and, spiritual experience.

4.2.4 Transformational Tourism- Making Sense of the Place

Transformational tourism is the new powerhouse of tourism, which has recently been appreciated as a tool for transformation all over the world. The work environment, urban lifestyle, stress and anxiety issues, fast-paced life, pollution and crowds are some of the aspects that are affecting human life. The unhappiness quotient in humans in different walks of life is increasing. People do seek shelter either in blessings of the almighty or they seek relaxation in pursuing some hobbies, or travelling. Travel for transformation is on the increase. The believers choose the god's path-pilgrimage tourism. The non-believers findsolace, peace, healing, relaxation, rejuvenation, re-start, refresh and all these abstracts in tourism, specifically through transformational tourism. Uttarakhand is a place blessed with the power of transforming people's lives positively. The peaceful, green, serene Uttarakhand has many forms of tourism other than religious *Char-Dham* yatra, which falls under the ambit of transformational tourism. These are rural tourism, spiritual tourism, nature-based tourism, wellness tourism and adventure tourism. All these forms of tourism are experiential and have the power to transform people for good. The very concept of transforming lives can be the underlying concept of Uttarakhand Tourism and goes a long way in realising the Vision 2030 of the State. Pilgrimage tourism would be everlasting, but now Uttarakhand needs to evolve with the products that show its distinctive expertise. Interestingly, this distinctiveness of Uttarakhand is in market demand and considering the Vision Document 2030 of Uttarakhand harnessing the potential urban market in the name of transformational tourism will be beneficial for the State in the following terms:

- A specialised product focused on health and well being in the form of transformational tourism will be offered.
- This transformational tourism tag will offset the challenge of the seasonality of *Char-Dham* Yatra when it is not being organised
- Transformational tourism products will act as supplementary products during the yatra time, and thus, the same will ease up the crowd management
- Transformational Tourism, which has been acting as a supplementary product during the yatra time, will become the core product of Uttarakhand when yatra is not taking place.

Presently, the fast pace economy of the world and ever-changing lifestyle is putting up a lot of burden over the youth and the working class. These working people are settled in cosmopolitan cities and are involved in a lifestyle, which is not balanced and comes up with stress and anxiety issues. Sustainable Development Goals of the United Nations has categorised the health and well-being issue in SDG 3 and is determined to curb the menace of mental health and suicidal tendencies amongst the working class and especially amongst youth. India being a fast-developing nation along with developed nations of the world is facing the challenge of stress, depressionand anxiety amongst the people who are working in big cities. However, the recent trend has shown that Hollywood personalities and many other well-known people of the world have

been travelling or settled in Uttarakhand in search of solace and peace. People from India and across the world have been considering India as a nation of spirituality and *Vishwa Guru* and the best place in India to find enlightenment is present in the laps of Himalaya and is known as Uttarakhand.

Uttarakhand only needsto realise its potential of transforming the lives of people through religious and non-religious ways, which can be clubbed under the umbrella term of transformational tourism. Uttarakhand to break the stereotype image of pilgrimage will surely come out with the new thing encompassing pilgrimage, which would be known as transformational tourism.

Today, tourists are active participants who seek experiences rather than seeing or viewing the place. Slogans, earlier, were largely descriptors of the place. They tend to describe what a destination or the experience would be. While descriptors intend to capture the essence of the destination in some cases, they tried to capture the spirit of experience that is offered. Branding is not about 'attention catching' slogans; it is about executing the idea of a destination- what a destination stands for. Most competitors are reinventing their brands from being passive to being active brands that empower tourists. Today there is a definite shift in sloganeering. From announcing 'what is being offered', slogans today tend to empower visitors in terms of 'what they can do?' The slogan of Uttarakhand tourism is “Simply Heaven”. It tends to suggest what the place is like. What might be more important for the patrons would be to figure out what could they do in such a place that claims to be heaven? They would rather want to bring about a change in themselves after visiting such a 'heavenly' place. Uttarakhand tourism may like to consider having an activity-based slogan/ tagline, which indicates change or transformation. The ***transformation*** could be a possible keyword. Transformational Tourism is capturing the attention of visitors globally, more specifically the generation Y and Z.

Uttarakhand is known for its untainted, untouched nature - mountains, riversand forests. The tourism brand needs to piggyback the personality of the place and the place brand. 86% of the State is hills. Around 86% of the croplands are in the plains of the State. The key industries of the State's hill districts are hydropower and tourism. Accordingly, Uttarakhand needs to evolve as a destination that offers experiences in its natural settings. Key products include Spiritual tourism (Religious tourism, Aashram based Tourism, Char Dham Yatra, etc.), Nature-based tourism (Eco-tourism, herbal tourism, wildlife photography, birding, educational tourism, etc.), Adventure (mountain-based, and river-based) tourism, Wellness tourism (Yoga, Ayurveda, meditation, soft adventure) and Rural tourism (including weekend retreats, gastronomic tourism, handicrafts, local culture etc.). Ancillary offers could include low impact MICE, education, golf, medical tourism, etc. The major markets include domestic religious tourists; vacationers to hill stations- Mussoorie, Nainital, Dehradun and now alternate destinations like Dhanoulti, etc. State also attracts a good number of weekend retreaters; urban youth for adventure. There is an increasing number of international spiritual and wellness visitors. State also attracts adventure tourists and naturalists. Access is a challenge, but a lot of transport infrastructure is being developed. With Uttarakhand emerging as a hot tourist and industrial destination, the State government is focusing on upgrading the Jolly Grant airport as an international airport, in coordination with Airports Authority of India

4.2.5 Role That Tourism Can Play in Achieving Uttarakhand SDGs

During the 70th session of the UN General Assembly, 154 heads of State or government adopted the 2030 agenda for sustainable development along with 17 UN Sustainable

Development Goals Uttarakhand Vision 2030 has adopted these SDGs under various dimensions. - Sustainable Livelihoods, Human Development, Social Development and Environmental Sustainability

Uttarakhand Vision 2030 and Uttarakhand tourism's philosophy are grounded in the SDGs, and specific core strategies and actions have been developed to achieve the targets. Although all of the SDGs were about tourism to varying degrees, some of them strongly leverage on tourism in Uttarakhand Vision 2030.

The **sustainable livelihoods** approach is primarily focused on livelihoods for people, especially in rural areas, and underscores sustainability to ensure poverty reduction. Sustainable livelihood aims at providing a secondary source of income to rural residents. Tourism has been identified as one of the major growth drivers for achieving sustainability goals in the State.

As per SDG1, tourism has the potential to slow down migration from rural to urban areas, and it can help in overcoming the issue of poverty.

SDG 2 mentions that ecotourism combined with angling activities and fishery can help expand the water resources, which will help in fulfilling the goal of sustainable agriculture and ensuring sustainable food production systems. Activities in the trade, hotels and restaurants sub-sector have been contributing to a rise in employment, with tourism being one of the growth engines of the State.

The State government has come up with two schemes that help in increasing employment opportunities in tourism- VCSG Self Employment Scheme in Tourism and Pt. Deendayal Upadhyay Gramin Paryatan Vikas Yojana.

SDG 8 specifically targets that by 2030, the State will devise and implement policies to promote sustainable tourism. The State will aim at developing rural tourism, sustainable tourism destinations and trekking/mountaineering tourism as well as spiritual/yoga/wellness tourism destinations alongside the more frequented destinations or hotspots. Women are also getting empowered because of the various schemes of the State government.

SDG 9 gives paramount importance to optimising the potential of industrialisation and tourism promotion in the State. SDG 3 under the **Human Development** dimension of Uttarakhand Vision 2030 relates to the tourism industry. The strengthening of AYUSH can also help promote tourism. Yoga and Panchakarma centers have been proposed in the National AYUSH Mission document. This initiative, with cooperation from the tourism sector, can attract many longer stay tourists. Developing centers such as AYUSH Grams, Yoga Grams, and Wellness Centers can further enhance medical tourism, and the government can also opt for private sector participation in this sphere. Local employment and income will get a boost through such initiatives.

SDG 5 from **Social Development** dimension talks about achieving Gender Equality and Empower All Women and Girls. The tourism industry can be a huge contributor to achieve this goal. Tourism helps in education and skilling of women. It provides them with entrepreneurial opportunities. It helps to eliminate all forms of violence against women and girls in public and private spheres. Although Uttarakhand Vision 2030 does not mention the role of tourism in any of the targets under this dimension, tourism can be a major driver to deal with these issues.

SDG 11 from **Environmental Sustainability** dimension of Uttarakhand Vision 2030 emphasises on making cities, and human settlements inclusive, safe, resilient and sustainable and SDG 15 aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. This step will help in strengthening efforts to protect and safeguard the world's cultural and natural heritage. The State aims to establish a land bank for creating the infrastructure for tourism. Communities can be involved in biodiversity conservation, protection and rejuvenation of springs and water resources. Community-led anti-poaching units can be set up to safeguard tourism resources. It is imperative to regulate tourist movement within the national parks and glaciers.

4.2.6 UK Vision 2030, Tourism Policy 2018 and Implementation of Plans and Projects

The Tourism Policy of Uttarakhand -2018 is detailed and elaborate. It includes a SWOT analysis of the existing situation of tourism in the State and displays a clear vision. The policy also includes various opportunities for product development and promotion of tourism. But there are certain gaps in the policy when it is compared to the long-term development vision of the State as mentioned in the Uttarakhand Vision 2020 document. Gaps are also noticed between the Tourism Policy and implementation of strategies, plans and projects. These gaps are:

- One of the strategies for decent job creation, as mentioned in Uttarakhand Vision 2030 is organizing job fairs. There is no mention of such strategy in the Tourism Policy 2018
- The State should encourage women entrepreneurs to come up in tourism sector, to make them financially independent. The State Tourism Policy should be strengthened in this aspect.
- Safeguarding the cultural heritage of the State needs to be included in the Tourism Policy.
- There is little coordination among funding agencies such as JICA, ADB, and the World Bank to support tourism related activities in the state. Funds are of utmost importance for planning and development. The State should work towards garnering necessary financial resources.
- There is a shortage of newer tourism products which can help in job creation, sustainable development and overcoming the issues of seasonality
- An assessment of the carrying capacity (physical, natural, cultural, economic, perceptual) needs to be done and should be included in the policy document.
- A plan on solid waste management is missing in the policy
- An assessment on community non-participation or hesitation in participation should be done before coming up with newer schemes for rural community development.
- Professionalism related to planning and implementation of plans and projects is noticeably lacking, particulary in the functionaing of Uttarakhand Tourism Development Board. There is a need to overcome this through induction of highly experienced professionals with the national and international track record of tourism promotion, to assist in development of appropriate strategies, implementation plans, resource mobilisation, promotion of investments in workdclass tourism facilities and destinations through PPP and marketing in domestic and international markets.
- State Tourism Master Plan 2007-2022 and State Tourism Infrastructure Development Plans should be disseminated in order to encourage communities' participation in making the same successful. Progress of the plans should be periodically discussed with respective communities/stakeholders.
- Governance of tourism sector, which is a major growth driver in the State, requires a strong and empowered stewardship, if the State is to realise its tourism potential. There is a need to prioritise interventions and steer the Department to secure financial closure of the same, ensure that detailed annual plans are prepared and measurable progress indicators in terms of process and outcomes are set beforehand, and these are then concurrently used to regulary monitor performance.
- COVID-19 pandemic necessitates a revisit of the Tourism Policy to realign the same to position Uttarakhand as a safe and envigorating destination foradventure sports, eco-tourism, immunity boosting wellness retreats, yoga centres and spiritual experience.
- Dedicated single window system under EODB having clear approval timelines and protocols, should be immediately established for clearance of all large, medium, small and micro tourism projects.

4.2.7 Areas of Concern for Uttarakhand

4.2.7.1 Overtourism

Destinations around the world are competing for tourist traffic. However, hosting tourists has associated monetary and non-monetary costs that include hostility from the host community. Recently, several tourism cities have reported overtourism. In Uttarakhand destinations like Mussoorie, Nainital, Ranikhet, Char Dham, Jim Corbett, Binsar etc. are over-crowded during peak tourist seasons and need urgent interventions like identification of permissible carrying capacities to enable sustainable planning, traffic and tourism management strategies (1.4.2). There are numerous instances where development is on disaster-prone zones. (1.4.1). Uttarakhand must take note of overtourism in popular tourist destinations and plan accordingly.

Char Dham Yatra is a popular tourism product of the State from times immemorial. It largely attracts domestic tourists from all over the country during the tourist season from April/ May to mid-November. *Yatri*s are typical budget travellers who characterise modest expenditures. They come in large groups to reduce the costs of travel. The costs of organising and managing the yatra are high for the State administration without commensurate returns. However, the *Char Dham Yatra* is an emotive issue and must be addressed accordingly. Of late it has also attracted some international visitors.

Many tourist cities like Nainital and Mussoorie have reported exceptionally high peaks of tourist inflows during vacation and weekends. Efforts must be made to declutter the cities and spread the tourists to outskirts and rural communities close to these rural communities, which can accommodate visitors overnight. Uttarakhand should continue to improve its urban infrastructure and civic amenities. Effective capacity of cities can be enhanced through controlling the tourist footfalls (better management), traffic regulation and larger parking spaces. Many destinations around the world like Milan, Florence, Brussels, Vienna, etc. who face similar challenges have a differential city tax population where the costs of staying back in the city are higher, thereby motivating visitors to disperse towards lesser populated outskirts.

Parking and traffic management is a challenge in this largely hilly State. There is a need for large-scale parking in popular destinations of Uttarakhand. There is a need for differential parking pricing and tolls to discourage parking in busy city centres and towns. There could be additional costs for the polluting vehicles and some encouragement for non-polluting vehicles and modes of transport

Uttarakhand Tourism should focus on tourism yields rather than tourist traffic as an indicator of the performance of the tourism sector in the State.

4.2.7.2 Migration

Rural out-migration in Uttarakhand has assumed alarming proportions. A report by the Migration commission suggests that the number of uninhabited villages in the State has increased from 1034 in 2011 to 1768 in 2018. Tourism can play a vital role in arresting, if not reversing, the migration. Tourism can create local jobs.

The Government of Uttarakhand must consider a Second Home Policy targeted at these deserted ghost villages. This policy would allow people to have a second home in deserted villages of Uttarakhand. Second-home mobility will contribute to the seasonal redistribution of the population, including counter urbanisation. This mobility will also bring much-needed investment and jobs to the rural Uttarakhand.

Uttarakhand Tourism may consider Italy's *Albergo Diffuso* model. It is revitalising dwindling communities across rural Italy by repurposing their unused buildings into 'scattered hotels'. The concept is to transform many of the empty houses in these villages into a "diffuse hotel," in which the guest rooms are intermingled with the homes of village residents. Scatter Hotels follow a set of rules that ensure authenticity and independent ownership.

4.2.7.3 MICE

There is a discernible push for promoting MICE tourism in the Tourism Policy of the State. However, the conventional MICE industry requires investments in infrastructure and high impact convention centres and hotels. Given the fragile ecosystem of Uttarakhand, the proposal to push the MICE sector needs a rethink. The State's Vision 2030 document, however, refers to

promoting weekend meeting and event destinations. Uttarakhand must restrict to 'low-impact' events and outdoor corporate activities.

The Uttarakhand government may consider inviting private investment to convert ghost villages into scatter hotels, which can be used for low impact events. Using ghost villages for tourism will also contribute to reversing migration.

4.2.7.4 Sustainability

Uttarakhand is an ecologically fragile State marred with natural disasters in recent past, a part of the blame has been attributed to unabated tourism. Since the State is positioned as "simply heaven", pristine, un-spoilt nature is the core resource of the State with the potential to be rendered into tourism products. Environmental sustainability cannot be compromised. The State should have a policy for low impact tourism and hospitality infrastructure. The policy may restrain high impact/ high rise buildings in ecologically fragile regions of the State. This step will also encourage decentralised alternative accommodation, which is sustainable and affordable.

4.2.7.5 Nature-Based Tourism

Uttarakhand has been immensely endowed with un-spoilt nature. Nature-based tourism activities are one of the important tourism products of Uttarakhand. There are six national parks, eight wildlife sanctuaries and one biosphere in the State. Thus, there is huge potential for wildlife and nature-based tourism in the State. However, there are restrictions from the forest department to use these protected areas for tourism. Forest department needs to be engaged to allay their fears to allow access to visitors, at least on the periphery.

Eco-tourism has huge potential in Uttarakhand. The State has identified five ecotourism circles: Dehradun-Rishikesh-Tehri, Ramnagar-Almora-Nainital, Yamuna Yamuna Tons valley, Haridwar-Pauri, and Tankapur- Champawat- Devidhura (Pithoragarh)- Nainital. The 3-ecotourism destinations are being developed at Ranikhet, Ramnagar and Dhanaulti. The State may consider setting up an **Eco-Tourism Development Board** under the Forest Department as in Madhya Pradesh.

The board should evolve a scheme to engage communities on the periphery of these reserves for the conservation of forests and in supporting wilderness-based tourism on the lines of Mountain Shephard Initiative experiment in the Nanda Devi Biosphere Reserve.

Another challenge faced by Uttarakhand tourism is the double-fee structure (peak fees) for adventure activities, which has led to a decline in expeditions over the last few years as it renders expeditions less competitive vis-à-vis other Himalayan States.

4.2.7.6 Interdepartmental Coordination

The development of tourism in the State is hugely dependent on the coordination between various departments like the tourism department, urban development department, rural development department, Nagar Palika, Forest department, police, PWD etc. coordination needs to be strengthened It is suggested that each department should have a dedicated tourism budget head which can be utilized for the development of tourist facilities in the area. These will include the development of all-season roads, sanitation & hygiene, restrooms, roadside assistance, parking, safety and security, etc.

4.2.7.7 Capacity Development and Entrepreneurialism

Capacity building and skill development are an absolute requirement for any State to prosper. Although Uttarakhand has a lot of potential for the development of tourism, it lacks the required skills for the same. The Uttarakhand State Tourism Boardneeds to conduct various training and skill development programs to cater to the needs of various segments of tourism like transportation, accommodation, food and beverage service providers, guides, adventure tourism instructors etc. The government is focusing a lot on the development of homestays in the State. The success of this project hugely depends upon the skill up-gradation of the local communities, as they need to understand the importance of the scheme. The skill training should focus on developing the entrepreneur mindset so that they can help in increasing employment in villages.

Also, capacity-development measures will help in dealing with crime against women. Uttarakhand Tourism has recently signed a MoU with MakeMyTrip to market homestays and for capacity development.

4.2.7.8 Addressing Stakeholder Concerns

Discussions with key stakeholders such as hoteliers, restaurant onwers, tour operators, dhaba owners, transporters, adventure sports operators and roadside facility operators brought out the following challenges faced by them, that require to be addressed to bring about systemic strengthening:

- **Accessibility**. Good accessibility in terms of roads, rail/air frequency and capacity; affordable airfares are obstacles cited;
- **Adequate supply of water** is considered a challenge;
- **Lack of cold supply chain** in terms of refrigerated trucks and cold storages in districts to provide foodstuffs throughout the State is considdred a dampner for those who wish to establish lodging and boarding facilities in the hill districts and remote but highly scenic areas;
- **Tourism infrastructural facilities** such as wayside facilities, broadband connectivity, village haats, amusement parks, camping sites, sewage, drainage and solid waste management, ropeways, good quality, affordable and dependable transportation are some of the facilities reportedly lacking, which discourage longer stay tourists to venture to newer areas of the State;
- **High taxes** discourage tourists;
- **Lack of aggressive marketing and lack of use of social media,** of numerous tourist destinations and showcasing of the attractions was cited by several stakeholders;
- Lack of dependable **room reservations portals** which do not fleece and cheat the lodging owners was also cited as a challenge;
- **Good quality human resource** was also cited as a challenge as well as attrition in the workforce:
- **Lack of awareness of tourism infrastructure development schemes** that the stakeholders could avail, was also voiced;
- **Complex procedures**, long delays and lack of handholding to complete the required documentation, were cited as reasons for not availaing financial assistance under multiple government schemes;
- **Changing government policieis** and legal interventions were also considered to be challenges.

4.2.7.9 Negative effects of Covid 19 on tourism related activities

The coronavirus pandemic has very tangible effects on tourism industry. With Railways and airways on standstill, closure of famous tourist sites, restriction on Char Dham Yatra, cancellation of famous festivals like Kavad Yatra which brings tourist from all over India to Uttarakhand. The small and large businesses associated with such festivals and tourist places will suffer. The share of tourism industry in GSDP will decline. A special support package developed with government ministerial departments to provide financial and social help to tourism companies and workers that are being particularly affected by this crisis will give a boost to Uttarakhand tourism industry in the future.

4.2.8 Deen Dayal Upadhyaya Homestay Scheme

Deen Dayal Upadhyaya Homestay Scheme is a project by Uttarakhand Tourism department to create employment at local level and to attract tourists to off-beat tourist destinations of Uttarakhand alongside the popular ones. The program aims to enhance employment opportunities for the native people, increase accommodation facilities, stop migration and provide additional sources of income to the house owners. The objective is also to provide clean and affordable homestay facilities to domestic and international visitors and showcase the nature and culture of Uttarakhand through homestays. There are ~ 2000 homestay units in Uttarakhand as of January 2020. The government is providing various benefits to homestay entrepreneurs, like-

- District level awareness camps are being organized
- Hospitality training is being provided to homestay operators

- Subsidy of 33% or up to a maximum of 10 lac, discount on loan amount is allotted to hill areas
- 25% subsidy or up to a maximum of 7.5 lac, discount on loan amount is allotted to plain areas
- Discount of 1 Lac on interest for plain areas for first five years of loan repayment tenure
- Discount of 1.5 Lac on interest for hilly areas for first five years of loan repayment tenure

The thought behind the scheme is that if the locals register their homes as homestays or utilise their land for building new homestays or even if they renovate their old houses and run it as homestays, it will compensate for local tourism infrastructure in remote areas. In this way mountainous regions can be developed as tourist hubs. As per the rules of the government, if six or more homestays are registered from a particular area then the government will develop it as a cluster by providing road, electricity and water. The representatives of the tourist departments and banks will provide detailed information about the formalities related to the scheme to the beneficiaries. The Uttarakhand tourism department has appealed to the people who had left their villages to return and take advantage of the scheme. They are encouraging the locals to renovate their ancestral properties and run them as homestays as the villages will once again revive its economy this way. The scheme requires a bigger push with strengthened and more proactive backward and forward linkages to make it a big success, adopting a targeted approach focused on specific areas/blocks identified for promotion of rural tourism, which in turn supports multiple tourism activities according to the intrinsic strength of the areas.

4.2.8.1 Lessons from Homestays in Malaysia

These days, travellers look for different ways to experience the country or place they are visiting, instead of just going for the usual "touristy" stuff. The homestay experience is an important aspect of experiential travel, especially in multi-cultural countries like Malaysia. In Malaysia, what the tourism and hospitality industry usually promote is the village homestay experience. This is where guests get to live in an actual village. In Malaysia, villages that take part in the homestay programme are carefully selected and need to comply with strict guidelines from the Ministry of Tourism in order to bring out the best homestay experience for guests. At the 20th Malaysia Tourism Awards earlier this year, 16 homestays were nominated for Best Homestay in Malaysia. When travellers opt for a village homestay experience, they get to try out activities that they otherwise would not have access to. Each village homestay might offer different types of activities, depending on the culture, food, economic activity and location.

In Malaysia, homestay activities have been categorized into culture and lifestyle; economic activities; recreation; and environmental preservation.

- Culture and lifestyle include activities like experiencing traditional music, dance, games, or even attending a traditional festival or wedding ceremony.
- Economic activities include rubber tapping, fish breeding, as well as agricultural activities like paddy planting/harvesting, cocoa harvesting, oil palm harvesting, and fruit plucking.
- Recreation includes sightseeing and visiting nearby attractions, as well as outdoor activities such as jungle-trekking and white water rafting.
- Environment preservation includes eco friendly activities like tree planting.

4.2.8.2 Lessons from Homestays in Himachal Pradesh

Himachal Pradesh tourism department focuses on conservation of culture and nature through its homestay programme. The homestays are encouraged to follow eco-tourism practices. Along with homestays they also promote local Himachali handicraft, dance, music and other forms of art. The homestays also promote local style of architecture to ensure that local craftsmanship is not lost. The homestays try to give local experience to the tourist by several activities like tasting the local cuisine, short and long treks, and various adventure activities like fishing, bird watching, nature walk etc. Some of the very famous examples of homestays in Himachal Pradesh are Sunshine Himalayan

Cottage in Tirthan Valley, Darang Tea Estate in Kangara and Navek La Country Home in Dharamshala. These have adopted best practices to conserve nature, culture, local practices, local architecture and they also organize various activities for community benefit. Through homestays the State government is trying to achieve the objective of decongesting the cities and carrying the benefits of tourism to rural and interior areas of the State.

Uttarakhand Tourism- The Way Forward

Based on the analysis of strengths, weaknesses, opportunities and threats of the Uttarakhand tourism industry, the following is the proposed way forward:

Vision

There should be sustained strategic efforts to offer tourism products developed around the organic personality of the State of Uttarakhand. Pristine, unspoilt nature is the core resource. Uttarakhand should focus on transformational tourism where key products would include- Spiritual (religious) tourism, Nature-based (eco-tourism, herbal tourism, wildlife photography) tourism, Adventure (mountain-based, and river-based) tourism, Wellness (Yoga, Ayurveda) tourism and Rural (including gastronomic tourism, handicrafts) tourism. Ancillary offers could include low impact MICE, education, etc

Strategic Interventions

1. Focus on tourism yield rather than tourist traffic alone.
2. Plan for management of overtourism.
3. Declutter Dehradun and other major cities. Plan for an alternative educational hub.
4. Create a separate cadre of *Tourist Police,* which can multitask for first-aid, tourist information, roadside assistance, traffic controller etc.
5. For Ghost-villages have a Second Home Policy and a Policy for Scatter Hotels.
6. Have a policy in place a traffic policy for tourist- differential parking and tolls to encourage visitors to leave busy locations for outskirts.
7. Uttarakhand must restrict MICE to low impact events and outdoor corporate
8. Provide for capacity building, especially for homestays, adventure sports, culinary trades, wellness instructors, disaster management, etc.- under the MoT, GoI's capacity building schemes.
9. Promote rural tourism entrepreneurship and provide for incubation and handholding.
10. Policy for low impact tourism and hospitality infrastructure, including sustainable vernacular architecture.
11. Separate promotional campaigns for domestic segments and inbound segments. Extensive use of social media for promotion.
12. There should be continuous research and customer feedback monitoring

Tactical Moves

1. There is a need for better interdepartmental coordination. Department of Tourism can serve as a facilitator for coordination among various departments like the forest department, rural development department, urban development department, department of culture, Department of AYUSH police, PWD, police, gram panchayats, etc. for the development of tourism in the area.
2. The Forest department poses major challenges as most of the Uttarakhand's tourism assets are natural. The Forest department has severe restrictions on activities in the nature-based zone. Ropeway projects are held up due to this.
3. Identify and develop micro destinations for slow tourism. Such destinations should focus on weekend urban market and should be well connected to them,
4. An annual calendar of fairs and festivals in the State should be created well in advance. There should be fixed dates for major events. Information should be made available to the public and intermediaries well in advance.
5. All departments concerned with the creation of tourism infrastructure or its maintenance should have an earmarked budget allocated for tourism-related activities like maintenance of the roads, hygiene and sanitation, electricity, CCTV etc.
6. There is a shortage of workforce in all the departments. Vacant positions should be filled up and newly inducted personnel trained well to perform designated functions.

7. Marketing should be based on creativity. Promotional creatives cannot be tender based as it is a creative endeavour. Each tourism product/destination varies in nature and targets a different audience, and so a multi-modal approach should be followed. Uttarakhand should consider the effective use of social media for marketing its tourism products and destinations.
8. Measures should be taken to deal with seasonality and the creation of theme-based circuits.
9. Effective steps should be taken for the regulation of traffic, especially in pilgrimage sites and ecologically fragile zones. Management of Char Dham Yatra merits immediate attention. Uttarakhand must consider the use of IT and the best practices of Tirupati.
10. Tender for electric bus service from Kathgodam to Nainital and Dehradun to Mussoorie was advertised, but no interests were received. So, the focus should be on PPC and PPP.
11. Development of world-class services like 5-star hotels and convention centers in cities is needed.
12. Village development plans with a tourism component should be discussed at the Gram Panchayat level. More the ownership of the host community, more sustaining will the tourism development will be.
13. More training and skill development programs should be organised for community-based tourism.
14. There is no evaluation on carrying capacity as of now. The State must conduct carrying capacity studies for its major tourist destinations.
15. Peak fees for mountaineering should be waived off. The process of obtaining permission and payment of fees should be simplified.
16. Use of advanced technology for waste management and increased use of bio-toilets.
17. For adventure tourism the Department of Sainik Kalyan may be leveraged as a technical partner.
18. Restoring travellers' confidence by putting up some standards in terms of safety and hygiene (Clean labels at Hotels and Restaurant) to reassure visitors a safe travel.
19. Consider implempenting a touchless solution and promoting digital transaction wherever possible to limit the scope of virus transmission and also enabling a positive travel experience.

Box 1: Global Tourism in 2018

2018 was the 9th consecutive year of sustained tourism growth globally. Global tourism and travel grew by 3.9% in 2018, whereas the global GDP grew by 3.2 % during that period. Tourism contributed 10.4% to the global GDP, which was USD 8.8 Tn. Tourism accounted for a tenth of all jobs in 2018. Leisure tourism accounted for 78.5 % of global spending on tourism and travel. Globally, the domestic tourist spending was 71.2% whereas the foreign tourist spending was 28.8% of the total. International Tourist Arrivals (ITA) grew by 5.6 % to reach 1.4 b in 2018. Asia and the Pacific recorded a growth of 6.5% in ITA. International tourist arrival was 345.1 m. In the first half of 2019, International Tourist Arrivals increased +4% year-on-year. In relative terms, the Middle East (+8%) and Asia and the Pacific (+6%) led growth between January and June 2019. UNWTO maintained that the drivers of these results had been a strong economy, affordable air travel, increased air connectivity and enhanced visa facilitation.

According to the World Tourism Organization, international tourism receipts were US$1.7 trillion in 2018, an increase in real terms of 4% over 2017.

UNWTO has highlighted that global tourism has been characterised by trends like Travel 'to change' which includes living like a local, quest for authenticity and transformation. The next important trend is the travel 'to show'. It includes 'Instagramable' moments, experiences and destinations. Also trending in 2018-19 is the pursuit of a healthy life. Travellers preferred walking, wellness and sports tourism.

Box 2: Indian Tourism

Indian tourism continues to be a key driver of economic growth in the country. Given the rich cultural heritage and diversity of terrain and ecology spread across the length and breadth of the country, India continues to attract visitors from all over the world. During 2018 India has recorded 10.54 million foreign tourist arrivals (FTAs) with an annual growth rate of 5.2 %. Foreign Exchange Earnings (FEE) from tourism had grown by 4.7% to be at US$ 28.585 Billion. International departures have increased by 9.8% to 26.30 million. Domestic visitations have increased at 11.9% to reach a record level of 1.85 billion. India's share in International Tourist Arrivals (ITAs) was 1.24% in 2018. India wishes to achieve a 2% market share by 2025.

Globally, India is doing well in tourism. According to WTTC, India ranked third among 185 countries in terms of travel & tourism's total contribution to GDP in 2018. India was ranked 34th in the Travel & Tourism Competitiveness Report 2019 published by the World Economic Forum. India is also the third-largest globally in terms of investment in travel & tourism with an investment of US$ 45.7 billion in 2018, accounting for 5.9 % of national investment.

India's competitiveness as a tourist destination has also increased significantly. The Travel and Tourism Competitiveness Report 2019 ranked India 34th out of 140 countries overall. India improved its ranking by six places over the 2017 report, which was the greatest improvement among the top 25% of countries ranked. The report ranks the price competitiveness of India's tourism sector 13th out of 140 countries.

Box: 3 Comparative of Uttarakhand Tourism with Himachal Pradesh & Sri Lanka

	Uttarakhand	Himachal Pradesh	Sri Lanka
	Uttarakhand Tourism Policy 2018	The Himachal Pradesh Tourism Policy, 2019	Sri Lanka Tourism Strategic Plan (TSP) 2017-2020/ Sri Lanka Tourism Vision 2025
Vision & Mission	To create Uttarakhand as a global tourism destination that is safe, sustainable and which includes world-class tourism products and services and which could unleash the true potential of the State	"Positioning Himachal Pradesh as a leading global sustainable tourism destination for inclusive economic growth".	-To be recognised as the world's finest island for memorable, authentic and diverse experiences. -To be a high-value destination offering extraordinary experiences that reflect Sri Lanka's natural and cultural heritage, are socially inclusive and environm-entally responsible, and provide economic benefi-ts to communities and the country. This four-year TSP indicates steps and actions necessary to move toward Sri Lanka's Tourism Vision 2025 ● Sri Lanka's Tourism Vision 2025 is based on the notion of appreciating one's roots as well as the strength, foundation and identity that one's roots provide. ● It highlights protecting not just the tangible, but the intangible. ● It promotes a sense of place and belonging and a voice for every community. ● It positions tourism as the vehicle to conserve preserve, protect and enhance Sri Lanka's plethora of natural and cultural assets .

Innovative Ideas and Strategy	• Develop Uttarakhand as weekend-based event and meeting destination • Emphasise on Community based tourism • Generate employment in non-farm sectors • Develop ropeways and funiculars	Tourism Promotion is done with the help of ten themes which include conventional tourism types such as cultural, heritage and natural along with innovative themes like, snow tourism, lake tourism, film tourism, agro-tourism, health and wellness tourism, MICE tourism etc. The destinations in Himachal Pradesh have been distributed theme-wise along with identification of potential areas that can be developed for tourism in the future.	Sri Lanka positioned as "The island for diverse, authentic experiences." Five geographical tourism zones are identified that cluster Sri Lanka's 25 districts Every zone will be encouraged to develop sites such as public parks, indigenous community neighbourhoods, Royal Craft Centres, centres for traditional medicine and meditation houses. The objective is to provide visitors with reasons to travel and immerse themselves within one zone for a longer period.
Promotion Campaigns and Slogans	Uttarakhand- Simply Heaven	• Destination Himachal' Campaign • Creation of 'Heritage Village' (Pragpur) • Destination for all Seasons and for all Reasons' • 'Unforgettable Himachal'	• Wellness Tourism strategy • 'So Sri Lanka'
Tourism Policy	The tourism policy of Uttarakhand is focused on • Development of Land Banks • Identify potential tourism places • Develop theme-based circuits	The tourism policy of HP is focused around three principles • Sustainable Tourism • Inclusive Tourism • Atithi Devo Bhava	The tourism policy of Sri Lanka is focused on • Enhancing demand • Market Segmentation • Source Markets • Optimising supply • Delivering Experiences • Spatial Planning

Implementation of Policy	State Government has formulated"*Uttarakhand Tourism Land Pooling & Implementation Rules 2017*" to enable faster and easier land identification and pooling procedures for tourism. This procedure shall also provide a suitable platform (to be develop-ed on PPP mode) for the new theme-based criterion. Tourism development will be a focus for lesser developed yet potential areas so that employment opportunities are created, and economic growth is ushered. The State is working towards the development of tourist facilities in the State. One of the aims is to promote and develop the Uttarakhand State as a wellness hub and to promote medical tourism-based packages. The efforts are also to ensure the involvement of other State and Central Government Ministries /Departments to leverage their strengths and schemes (e.g. Swadesh Darshan, PRASAD, AMRUT, Swachh Bharat Mission, Wellness Centre under Ayushman Bharat Scheme, Start-Up India, Hunar Se Rozgar etc.) for improvement of tourism infrastructure in the State.	Objectives focusing on different facets have been formulated to achieve the proposed target for 2029. **Objective 1:** To promote Tourism Diversification through theme-based development **Objective 2:** To safeguard the State's tourist destinations through sustainable interventions **Objective 3:** To ensure that sustainable tourism primarily benefits host communities **Objective 4:** To build capacity and develop quality human resource for the tourism industry **Objective 5:** To provide safe, secure and unique "Tourism for all." **Objective 6:** To create an enabling environment for investments for sustainable tourism Each objective is achieved through a set of strategies. The strategies are to be achieved through three action points Short Term(0-3years), Mid Term(3-5years) Long Term(5-10years)	• An implementation strategy and action plan with a pragmatic approach is developed in consultation with stakeholders; • Institutional improvements are executed to deliver the strategy, including intergovernmental coordination and communication; • The policies and legal and regulatory framework are reviewed to improve competitiveness, streamline investment and business operating procedures; • Pilot demonstration projects are initiated that follow the guiding principles and experience offerings; • A tourism industry human resources strategy is developed to fulfil the projected demand for qualified tourism and hospitality personnel while addressing the barriers of entry, retention and bench-marking; • Government agencies are supported to implement relevant management and preservation of cultural and natural assets. • A long-term targeted marketing strategy is formulated in line with the vision; and • Local-level integrated tourism development and destination management capacity is planned in pilot locations.

Impact	The policy has made a positive impact in the State especially through its two schemes- VCSG Self Employment Scheme in Tourism and Pt. Deendayal Upadhyay Gramin Paryatan Vikas Yojana. The VCSG scheme has more than 6387 registered beneficiaries as per the recent information (December 2019) which include hotels, food processing units, souvenir shops, laundry units, boat operators, and adventure sports equipment dealers. More than 1800 homestays have been registered under Pt. Deen Dayal Upadhyay Gramin Paryatan Vikas Yojna. The State government is providing attractive subsidies to the locals for starting their tourism-related businesses. The State has also made advancements by connecting many of its villages with cities. The community-based tourism is on the rise. Uttarakhand is now emerging as a family destination.	While traditionally Himachal was known as a summer destination, the Department of Tourism & Civil Aviation has taken special efforts to break the seasonality factor and has developed diversified tourism products to attract tourists in other seasons too. Now Himachal is known as a "Destination for All Seasons and All Reasons". The Department has laid special emphasis on the development of activity-based tourism and opening up of new sub destinations. Appropriate infrastructure is being developed within available resources to promote tourism in the countryside and to the unexplored areas. By focusing on quality tourists, the Department aims at promoting sustainable tourism and encouraging the private sector to develop tourism-related infrastructure in the State without disturbing the existing ecology and environment.	The policy has resulted in an increased contribution to GDP from the travel and tourism sector There are increased tourism employment and economic participation in each province as well as improved standards and skills The policymakers have initiated the process of transition to creating more extraordinary visitor experiences as well as improved connectivity and accessibility to and within Sri Lanka. Sri Lanka enjoys an improved destination perception and branding among international and domestic tourists along with improved capability and efficiency of Sri Lanka Tourism with strong working relations across and throughout government.

Comparison with Himachal Pradesh and Sri Lanka

Although Uttarakhand Tourism is taking initiatives for promotion of tourism, there are a few lessons, which can be learnt from neighbouring States and countries. For example, Sri Lanka is focusing on tourism as a vehicle through which the cultural roots of the country can be conserved and preserved along with the protection and enhancement of natural assets. This approach has made the policy socially inclusive and environmentally responsible. Sri Lanka is rich in natural resources, but the focus of the policy is on both tangible and intangible assets. It enhances appreciation of self-identity amongst the community, conservation of culture and protection of nature, all through tourism. Sri Lanka focuses on market segmentation, increasing demand, optimising supply and on delivering experiences.

Himachal Pradesh Tourism has also divided the assets of the State into ten themes and is promoting the destinations through a variety of tourism activities. The policy focuses on the inclusive and sustainable growth of the State. Both Himachal Pradesh and Sri Lanka are focusing on Wellness tourism to create a linkage between natural resources and tourism activities. The taglines/ promotional slogans of both reflect the diversity of the tourism resources. Uttarakhand Tourism should also focus not only on the conservation of nature and increasing job opportunities for the local community, but it should also emphasise on how the culture, traditional dance, music, craft, local cuisine, and ancient monuments which are in dilapidated condition can be conserved with the help of tourism. Uttarakhand as of now is known only for nature and pilgrimage. A vast dimension of cultural richness is still unknown to the world. This dimension can be developed along with community-based tourism/homestays and the locals should be trained, encouraged and motivated to showcase their culture to the tourists. The local community should be encouraged to appreciate its authentic culture and feel proud of it. Thus, not only the natural resources will be preserved, but the cultural aspect of Uttarakhand will also become sustainable.

4.3 MSMEs: Prospects and Policies

"A Big Business Starts Small"

-Richard Branson,Founder, Virgin Group

Abstract

The MSME sector of the State had grown from innocence to strength, since the inception of the State. The larger state specific challenge is the regional disparity among the hill and plain districts of the Uttarakhand, in terms of number of MSME units, investments and employment generation. The State has been putting in continuous endeavours over a period of time to address these issues and further envisages to make serious policy interventions in the time to come. These policies range from provision of incubation and Supply Chain Support for Rural Enterprises, to Skill Development through Vocational Training, improving marketing facilities, while these policies attemptto address the fundamental challenges that plague the MSME sector, there are areas that needmore attention in terms of policy in order to climb up the ladder from the present state of affairs. In this context, it is worth contemplating to identify the policy gaps and make efforts to improve upon them. The major gaps in the policy are found to be on the front of improving labour regulations, rejuvenating the State's Start-up Policy, enhancing financial literacy, and technological up gradation of MSMEs in the State and investment in key promotional infrastructure like rail and road connectivity, logistics hub,CETPs Policy interventions on this front could potentially take the MSME sector in the State to new heights in the time to come. Owing to the impact of COVID-19 on the MSME sector on June 1, 2020 the Cabinet Committee on Economic Affairs revised the definition of MSME as described in the table below:

	2006 Act		2015 Bill		2018 Bill	Cabinet (June 2020)
Criteria	Investment		Investment		Turnover	Investment and Turnover
Type	Manufacturing	Services	Manufacturing	Services	Both	Both
Micro	Up to Rs 25 lakh	Up to Rs 10 lakh	Up to Rs 50 lakh	Up to Rs 20 lakh	Up to Rs 5 crore	Investment: Upto Rs 1 crore Turnover: Upto Rs 5 crore
Small	Rs 25 lakh to Rs 5 crore	Rs 10 lakh to Rs 2 crore	Rs 50 lakh to Rs 10 crore	Rs 20 lakh to Rs 5 crore	Rs 5 crore to Rs 75 crore	Investment: Rs 1 crore to Rs 10 crore Turnover: Rs 5 crore to Rs 50 crore
Medium	Rs 5 crore to Rs 10 crore	Rs 2 crore to Rs 5 crore	Rs 10 crore to Rs 30 crore	Rs 5 crore to Rs 15 crore	Rs 75 crore to Rs 250 crore	Investment: Rs 10 crore to Rs 50 crore Turnover: Rs 50 crore to Rs 250 crore

Sources: MSME Development 2006 Act, MSME Development Amendment Bills 2015 and 2018, PIB update on cabinet approval; PRS.

Introduction:

The Micro, Small and Medium Enterprise (MSME) sector plays a pivotal role in the economy, by contributing not only to employment and output but also promoting inclusive growth. MSME sector made exponential progress over the years since the formation of the State. The State had 14,163 MSMEs, with an investment of Rs.700 crore and provided employment to only 38,509 people when it was formed. In two decades, MSME sector emerged as the second largest employment generator of Uttarakhand, with the first being agriculture sector. At present there are 53,000 MSME units, with a capital investment of Rs. 10,960 crore, and generating employment to 2,58,000 people. The State envisages to establish 1,70,000 MSME units, with a capital investment of Rs. 36,000crore, that could generate employment to 8,50,000people by 2030. Given this phenomenal rise in growth of this sector and its potential to grow further, it deserves a priority in the policy discourse and hence there is a need to take stock of the current status of MSMEs. This chapter makes an attempt to look forward by looking back. It is divided into three sections, thefirst section provides and overview of MSME sector in the State and helps understand the State's policy stance towards MSMEs over a period of time, and the issue of regional imbalances within the State in this regard. The second section provides the policy intentions aimed at further improvement of this sector. Concrete policy action that could result in potential benefits on the ground level, with respect to MSMEs is discussed.

The third section discusses such areas where the State could make new strides by learning lessons from the experience of other States of the country. It brings forward the success stories of States like Rajasthan and Telangana, where the former brought in flexible labour regulations to support MSMEs and the latter succeeded with an innovative Start-up policy. They offer policy lessons to improve State's business environment with respect to MSMEs and have the potential to take the sector to new heights. The idea of Unique Business Identifier has been mooted by taking cue from the report of the expert group on MSMEs, submitted to Reserve Bank of India in June 2019 and policy suggestions related to technology up-gradation and improving financial literacy are also discussed in this section. More importantly, this section attempts to identify the policy gaps, provides suggestions and also discusses the challenges in implementation of each policy suggestion and attempts to find the way ahead.The MSME sector faced a huge setback as a result of COVID-19, there was an absolute lack of demand and supply for a long period of time which led to shortage of workforce, loss of livelihoods, revenue and taxes. In the light of the pandemic, the Mukhyamantri Swarozgar Yojana will be providing loans for projects worth Rs. 25 lakh in the manufacturing sector and Rs. 10 lakh in the service sector. Workers registered under employee state insurance were provided Rs 1,000 each and a portal named "HOPE- Helping Out People Everywhere" was launched to create employment avenues for skilled youth.

Section-I

4.3.1 MSMEs in Uttarakhand: Status and Policies

4.3.1.1 State's Policies towards MSMEs:

The MSMEs covers a wide range of activities, cutting across of sectors. They are largely complementary in nature, to the existing large scale industries in the State and they have the potential to provide both backward and forward linkages in the rural areas of the State. Recognising the growing importance of the MSMEs and their potential to foster and strengthen innovation, the Government of Uttarakhand notified its MSME Policy 2015 to attract investments in MSME sector. This policy aims at promoting investment in the MSME sector by providing incentives towards this end. It aims at utilising local resources, to generate employment opportunities and promote self-employment, and to boost skill development among the youth. This Policy shall remain in effect till 31st March 2020. Fiscal incentives and other benefits of this policy shall be available to the eligible enterprise from the commencement of production up to a maximum of 10 years or 31st March 2025, whichever is earlier.

The state has been divided into four categories, viz., A, B, C and D for the provision of incentives and subsidy. Various activities have been identified under the manufacturing/services sector, which are eligible for fiscal incentives. They include the non-polluting manufacturing enterprises in the green and orange categories. However, fiscal incentives under the policy shall be available only for manufacturing activities in regions identified under Category C and D. The State also offers capital investment subsidy, investment promotion assistance, and reimbursement of electricity bills, Special State Transport Subsidy etc. for MSMEs. However, the facility of reimbursement of electricity bills will not be applicable to Hotel/Motel, Resort, Guest House, Steel Rolling Mill, Electric Furnace and other heavy Power consumption enterprises, according to the MSME Policy of the State. Table. No.4.11 depicts the categorization of various regions of the State.

Table 4.11: Categorization of Various Regions of the State:

Category	Regions Included
Category A	• Whole Districts of Pithoragrah, Uttarkashi, Chamoli, Champawat, Rudraprayag and Bageshwar
Category B	• Whole Districts of Pauri Garhwal, Tehri Garhwal, Almora, • All hilly development blocks of District Dehradun other than Vikasnagar, Doiwala, Sahaspur and Rajpur. • All hilly development blocks of District Nainital other than Haldwani and Ramnagar.
Category C	• Regions located above 650 mtrs from sea level of Raipur, Sahaspur, Vikasnagar and Doiwala development blocks of District Dehradun. • Ramnagar and Haldwani development blocks of District Nainital.
Category D	• Whole Districts of Haridwar and UdhamSingh Nagar • Remaining area of Dist. Dehradun and Nainital (which are not included in category 'B' & 'C').

Source: Uttrakhand Micro, Small & Medium Enterprise Policy-2015

On the other hand, thrust sector industries/ activities are as notified under the Special Industrial Package. In addition to this, activities, which have been granted the status of industry by the state government, viz. poultry farming and tourism activities, are the other category.

Following activities included in Special Industrial Package announced for the North-Eastern States:

- Hotel, adventure and vocational sports, ropeway.
- Nursing home with health and medical facilities.
- Vocational Training Institute viz. Hotel Management, Catering and Food Craft, Entrepreneurship Development Training, Nursing and Paramedical, Civil aviation related training, Fashion Designing and Skill Development training.
- Biotechnology
- Protected Agriculture and Horticulture, cold storage etc. activities.
- Petrol-Diesel pumping station/Gas Godown

On the other hand, various schemes and programs for handloom and handicraft development are being implemented through Uttarakhand Handloom and Handicraft Development Council (UHHDC) and these products are being marketed under the brand name of Himadri. Various schemes of DC (Handlooms) and DC (Handicrafts) are being implemented under the Integrated Development and Promotion of Handicraft (IDPH). Under this scheme, the services of designers from reputed design institutes were taken for training and design workshops in 15 blocks, which gave very encouraging results.

In order to promote women entrepreneurship in manufacturing and service sectors, 25% Capital Subsidy (maximum Rs. 25 lakhs and Interest Subsidy @ 6% (maximum Rs. 5 Lakhs per unit per annum) has been approved under 'Nav Disha Yojana'. Moreover, endeavours are being made to address the difficulties faced by working women, with the support of Government of India, by introducing a scheme for grant-in-aid for construction of new/ expansion of existing building for providing hostel facilities to working women in cities, smaller towns and also in rural areas.

In addition to these measures, the last Friday of every month is being convened as "Self-Employment and Entrepreneurship Day" in all Districts. Officers from all related departments,

banks and other organizations are present to provide information and advise entrepreneurs. At State Level, Industries Associations and HODs of concerned departments meet in the Directorate of Industries. Potential investors are also invited.

Major activities of the MSMEs in various districts are explained in table no.4.12

Table 4.12: MSMEs in Uttarakhand and their Major Activities

District	Major Activities of MSMEs
Almora	Fruit Processing, Hotel & Resort, Auto Repairing Service, Tiles Manufacturing, Printing Press, Handmade Paper Manufacturing, Poultry & Hatchery, Auto Repairing Service, Transformer Repairing etc.
Chamoli	Hotel & Resort, Fruit Processing, Bakery, Eye Care and Optical Centre, Stone Crusher, Fruit Processing, Bakery Industry etc.
Tehri	Milk Products, Packaging of Drinking Water, Hotel and Restaurant, Card Board, Steel Seat Metal, Printing Press, Industrial Gas, Nitrogen Gas, Copper Wires, Milk Products, Packaging Drinking Water, Skill Development, Steel fabrication, etc.
Uttarkashi	Resort, Stone Crusher, Hot Mix Plant, Mineral Water, Hotel and Resort, Fruit and Vegetable processing, Printing Press, Woollen Shawl, ITES, Ayurvedic Medicines
Rudraprayag	Food Product, Milk Products, Dairy Products, Bakery Products, Hotel, Stone Crusher, Auto Mobile Repairing, Milk Products, Tailoring, Fruit Processing etc.
Champawat	Hotel and Restaurant, Readymade Garments, Rice and Paddy Husk, Fruit Juice, Poultry and Hatchery, Plastic Chair, Readymade Garments etc.
Pauri	Pet Bottle, Fabrication Works, Hotel & Resort, Furniture, Paper Plate, Handicraft, Printing Job Work, Ayurvedic Medicine, Pharma Products, Milk & Milk Products, Electrical Panels, Aluminium & Copper Wire etc.
Pithoraga	Readymade Garments, Hotel & Resort, Cement Block, Tiles, Candle, Printing Press, Gate Grill, Mineral Water etc.
Bageshwar	School Dress, Hotel & Restaurant, Fruit Processing, Food Dishes, Honey Processing, Computer Repair & Cyber Cafe, Printing Press etc.
Nainital	Agarbatti, Readymade Garments, Packaging, Fruit Processing, Food Products, Casual Processing, Pharmaceutical Products, Hosiery, Paper Printing Press, Food Products, Hotel and Resort, Rice Mill, Kids Bicycle, Pillow Cover, Medical Service, Readymade Garments, Packaging , Purified water etc.
Udham Singh Nagar	Industrial Gas, Floor Mill, Rice Mill, Packaging and Printing Material, Food Processing, Corrugated Box, Cosmetic Products, Plastic Bottle, Handmade Paper, Cattle Feed, Poultry Feed, Paint Roller Brush, Automotive Parts, Handicraft Goods, Metal Ware, Spice, Animal Food etc.
Haridwar	Corrugated Box, Printing Box, Plastic Moulded Components, Sheet Metal Fabrication, Liquid Soap, Soap Cake, Mobile Phone, Tablet, Stone Dust, Spice & Herbal Oil, Mushroom Products, Stone Grits etc.
Dehradun	Fruit and Vegetable Sorting, Presentation and Grading, Bakery Products, Off Set Printing, Dona Pattal, Grain Milling, CLAFLED, Internet Service Provider, Offset Printing, Corrugated Box, Pharma Products, Steel Fabrication, Ayurveda Footwear Sanitary Napkin, Diaper, Pet Bottle & Cane, Water Pump Assembling, PCV Pipe, Artificial Flow Bridesmaid, water and beverages etc

While the activities are wide and varied across the districts of Uttarakhand, it is pertinent to note that there s a skewed distribution, favouring plain districts of the State, in terms of establishment of MSMEs, investments and the employment generation, when compared to hill districts of the State. It is depicted in table no. 4.13 below.

Table4.13:MSMEs in Uttarakhand: District Wise Distribution (Up to March 2019)

Districts	Total MSME Industries	Total Investment in MSME (INR Cr.)	Total Employment in MSME
Haridwar	10616	4850.7	93591
US Nagar	8221	4425.95	66007
Dehradun	8824	1392.3	54857
Pauri	6244	498.36	22292
Nainital	4454	1053.8	21061
Tehri	4555	296.1	13273
Almora	4171	210.7	9833
Pithoragarh	3224	97	7402
Uttarkashi	4172	114.8	8176
Chamoli	3331	103.6	7372
Champawat	1694	87.4	4571
Rudraprayag	2007	109.4	5295
Bageshwar	1870	60.6	4176
Total	**63383**	**13300.71**	**317906**

Source: Department of MSME, Government of Uttarakhand

The table above suggests regional disparities between the hill and plain districts of the State in terms of number of MSMEs distribution. Haridwar District tops the list by housing 10,616 MSMEs with investments worth Rs. 4850.7 and generating employment to 93591 people. While Champawat district houses least number of MSMEs (1694), Bageshwar has the lowest investment (Rs. 60.6 crore) and also the lowest number of jobs generated. This regional imbalance needs policy intervention that aimed at bringing down the disparities. Special emphasis needs to be laid upon the hill districts of the State in this regard. For instance, ABC zones have stringent restrictions which is why the small and medium enterprises are unable to manufacture in these areas, for instance in category B there is a 50 % subsidy on power but only up to 100HP, while a small/medium industry could consume way more. Policy decisions must be made in consultation and cooperation with manufacturers, which could help promotion of industries in the hill districts.

Measures that ensures easy accessibility and availability of credit, removing the infrastructural bottle necks and formulation of policies with time bound targets to be achieved in the hill districts could go a long way in bringing down this disparities. The State is making efforts to support MSMEs in terms of infrastructure. As a part of these endeavours numerous provisions have been made in order to ensure easier availability of developed industrial lands at reasonable rates to MSMEs. These provisions include the steps like establishment of land bank, infrastructural development fund for MSMEs, special industrial estate for MSMEs, establishment of new industrial estates, establishment of multi-storied estates, up gradation of existing industrial estates, establishment of vendor and ancillaries parks and making necessary interventions under cluster development Scheme.As a part of the institutional support, simplification and enactment measures, Uttarakhand passed the Single Window Facilitation and Clearance Act and also created the MSME development fund. In addition to this, Udhyog Mitra Committee was constituted to address various issues of MSMEs. In addition to this, Uttarakhand Micro and Small Enterprises Facilitation Council Entrepreneurship and Skill Development Cell and the Vendor/Ancillary Enterprises and Cluster Development Cell have been established.

4.3.1.2 Start-up Policy of the State:

Start-up India Scheme is an initiative of the Indian government, the primary objective of which is the promotion of start-ups, generation of employment, and wealth creation. It was launched in January 2016. Start-ups are incorporated as a private limited company (as defined in the Companies Act, 2013) or registered as a partnership firm (registered under section 59 of the Partnership Act, 1932) or a limited liability

partnership (under the Limited Liability Partnership Act, 2008) in India. These enterprises can be called Start-ups up to ten years from the date of incorporation/ registration provided turnover for any of the financial years since incorporation/ registration has not exceeded Rs.100 crore. The profits of recognized Start-ups are exempted from income tax for a period of 3 years out of 7 years since incorporation

In line with the policy of the Union Government, and in addition to the existing MSME policy, the State notified its Start-up policy 2018 with an aim to provide a platform to nurture entrepreneurs. Under the Start-up Policy, the State provides incentives such as monthly allowance, marketing assistance, stamp duty, SGST etc., for the start-ups recognised by the State. Capital grant, running expenses are also provided for Incubators set up in the State. In addition to these polices, the State envisages concrete policy action, that could result in potential benefits on the ground level, with respect to MSMEs. They are discussed here under.

Section-II

4.3.2 Policy Intentions

4.3.2.1 Implementing Chief Minister's Rozgar Yojana (CMRY) with Central Funding:

Uttarakhand has region specific challenges due to geographical and climatic conditions. In addition to this, migration is another major challenge that the State confronts. The intensity of this problem is relatively higher in the border and hill regions, in comparison to other areas of the State. In this backdrop the State government's MSME policy provides various incentives for setting up MSMEs in the State and these incentives are higher in border and hill regions. The proposed strategy for encouraging MSMEs in the identified blocks would be to create awareness, and impart Entrepreneurship development training and further providing market support. The Chief Minister's Rozgar Yojana (CMRY) has been introduced to encourage ultra-micro enterprises, including trading and traditional service enterprises up-to INR 3-5 Lakhs. This scheme covers those who were not covered under Prime Minister Employment Guarantee Programme (PMEGP). Though this scheme became very popular, lack of budgetary support is the immediate challenge. In order to overcome this challenge, it is envisaged to implement CMRY as a special scheme in the identified blocks with central funding.

4.3.2.2 Funding the Growth Centre Scheme:

The Growth centre scheme was notified in 2018, where 82 Growth Centres have been approved. Out of these, 12 Growth Centres are in the identified 24 blocks. Agri-business - Vegetables, Floriculture, Spices etc, Wool, Milk, handicrafts and bakery are the major activities. It is envisaged to identify more growth centres. In addition to this, recurring cost financing may also be considered, as only capital expenditure is allowed under the scheme at present.

4.3.2.3 Improving Marketing Facilities:

The marketing events/exhibitions provides good marketing opportunities to Micro and Small enterprises. Already the numbers of these exhibitions to be increased and they are witnessing greater participation from the migration-affected areas. MSME haats at four places in the State provides provide marketing platform to enterprises from these areas and it is envisaged to increase their number, by developing haats at the strategically identified locations. Buyer-seller meets are also planned in such haats and clusters.

Policy initiatives to build infrastructure for online marketing, establishing a logistics hub, ensuring better road and rail connectivity, endeavours towards developing a dry port could go long way on this front. These measures are pertinent due to the fact that Under the Private Industrial Estates Policy of Uttarakhand, the MSMEs are facing hassle due to infrastructural issues with respect to lack of proper roads, central effluent treatment plants, drainage. If not addressed, these issues may result in the closure of many industries.

4.3.2.4 Project Identification:

The State is contemplating to undertake a block wise assessment in order to identify executable projects that could provide means of livelihood in the rural areas. To accomplish this task, it is planned to rope in experts and institutions to develop an overall plan for participatory research and identification of potential livelihood sectors.

Sectors/ activities like home stays, rural tourism, aromatic and medicinal plants, horticulture, floriculture, food processing, traditional handicrafts and other non-farm activities will be focused upon, in order to supplement the farm incomes

4.3.2.5 Incubation and Supply Chain Support for Rural Enterprises

Promotion of entrepreneurship and enterprise development is planned to be undertaken in target clusters (vulnerable blocks) in key growth areas. To realise this objective, end-to-end support in terms of skill, resources, linkages and handholding and support in launching businesses in the rural areas, would be provided.

In addition to this, supply chain support may be provided through creation of common facilities and clusters, provision of modern tools, quality control initiatives, and with necessary linkages to the national/ global brands in place. In addition to this, it is being contemplated to provide demand based infrastructure support to the MSMEs in the State and also encourage private developers to develop readymade sheds.

4.3.2.6 Market Development and Access

The State envisages developing market and market linkages for Uttarakhand's products at local, national and global levels through smart marketing, branding and promotional strategy ("Made in Uttarakhand"). It is being contemplated to hire professional services to promote brand "Himadri" for handlooms and handicrafts and also to develop marketing segmentation strategies, B2B and B2C strategies, store placement strategy and e-commerce linkages& also by providing support GI certification activities to build product value propositions & genuineness of the product.

On the other hand, Pharmaceutical sector of Uttarakhand is another major segment. The sector engages more than 300 units and it meets 20 % of the domestic needs of the country. But there is no subsidy on the capital up-gradation for testing equipment, which is a setback for the pharma sector. Even the food processing units are one of the potential area in the hills and more than 1000 food processing units have been installed. However marketing facilities andlogistics are the major challenge confronted by this sector.

4.3.2.7 Skill Development through Vocational Training

Realizing the importance of skill development in boosting the employment prospects of the youth, it is envisaged to establish an umbrella organization to train youth on relevant skills, with a focus on entrepreneurship development. First time entrepreneurs will be given hands and training and they will be made to undergo skill up gradation. A capable organisation may be selected through a transparent process to provide such training. An overview of the sectoral indicators for Vision 20230 for the MSME sector has been provided in table no. 4.14.

Table 4.14:Sectoral Indicators for Vision 2030 for the MSME Sector

Indicators	Current Status	2019-20	2023-24	2029-30
No. of MSME Units Established	53,000	68,000	94,000	1,70,000
Capital Investment (in Rs. Crore)	10,960	14,000	19,400	36,000
No. of Employment Generation	2,58,000	3,20,000	4,60,000	8,50,000

Source: Uttarakhand Vision 2030 Document, Government of Uttarakhand

Section-III

4.3.3 Policy Gaps and Suggestions

The State has been consistently attempting to address the State specific issues and challenges that confront the MSME sector. It has been making an active policy intervention from time to time, in order to address a plethora of challenges that MSMEs in the State faces. The policies range from provision of incubation and Supply Chain Support forMSMEs, to Skill Development through Vocational Training, and improving marketing facilities. While the policy intentions of the State that have been discussed in the earlier section attempts to address the fundamental challenges that plague the MSME sector, there are areas that needs more policy attention, in order to

climb up the ladder from the present state of affairs. This section discusses such areas where the State could make new strides by learning lessons from the experience of other states of the country. In addition to this, it also discusses the challenges in implementation of each policy suggestion and attempts to find the way ahead.

4.3.3.1 Labour Regulations: A Long Way to Go

The first issue is the flexibility in labour regulations in the State. In fact there is a significant evidence in the literature, suggesting that restrictive labour regulations prevents an open economy to reap its full potential. In fact the Economic Survey (2019-20) of Government of India highlighted the need for the policies that foster ease of doing business and flexible labour regulation, in order to promote entrepreneurial activity, especially in the manufacturing sector. This is due to the potential that the manufacturing sector has, to generate employment opportunities. It is in this backdrop, it is pertinent to note that Uttarakhand has still a long way to go on the front of bringing in a flexible labour regime relative to many other states in the country. An appendix has been provided at the end of this chapter in order to make a comparison of the State's progress relative to other states of the country, on the front of labour law reforms. It suggests the existence of policy gaps in bringing changes in legislative reforms, governance reforms and other initiatives. It is in this context, it is pertinent to understand the best models of bring in flexible regulatory regime, with respect to labour laws.

Taking a Cue from Rajasthan

The State may draw lessons from Rajasthan on the front of creating a flexible business environment by making amendments to the existing labour regulations. As a part of the labour reforms, Rajasthan brought in amendments in the labour regulations, which in turn had a significant positive impact on the Compound Annual Growth Rate of various variables. Those regulatory changes that brought in such an impact are discussed at length in the Economy Survey 2018-19, of the Government of India. They are summed up here under, which could be replicated in Uttarakhand.

Amendments in the Industrial Disputes Act, 1947

As per the new amendments, in order to form any union, the requirement of membership as a proportion of total workmen has increased from 15 % to 30 %.

For companies employing up to 300 workers, no government nod required for retrenching, laying off or shutting down units. Earlier this limit was 100 workers.

With regard to discharge or termination, a worker should raise an objection within three years. The law in its earlier version has no timeline set in place.

Amendments in Factories Act, 1948:

Threshold limit increased from 10 or more workers with power to 20 or more workers with power and 20 or more workers without power to 40 or more workers without power.

Complaints against the employer about violation of this Act would not receive cognizance by a court without prior written permission from the State government.

Amendments in the Contract Labour (Regulation and Abolition) Act, 1970

Applicable to establishments that employ 50 or more workers on contract against the earlier 20 or more workers on contract.

Amendments in Apprentices Act, 1961

Fix the number of apprentice-training related seats in industry and establishments.

The stipend for apprentices will be no less than the minimum wage.

To encourage skilling, government to bear part of costs of apprentice training.

The Economic Survey 2018-19 made an in-depth analysis of the impact of Rajasthan's labour reforms on different variables. It compared the number of operating factories employing more than 100 employees in the state, average number of workers per factory in a state, total output in the state and total output per factory in the state. The empirical exercise suggested that, for all the above variables, the Compound Annual Growth Rate in the post labour reforms period in Rajasthan has increased significantly, relative to rest of the country during the same period.

While Uttarakhand had recently trekked the path of path of Rajasthan in terms of bringing in amendments in the labour regulations, there is still a larger scope to improve upon the current status, which could further improve the flexibility and provides conducive environment for the businesses to flourish. This eventually could result in industry growth and employment generation. All that is needed is a strong political will.

4.3.3.2 Rejuvenating the State's Start up Model

While Uttarakhand provides incentives such as monthly allowance, marketing assistance, stamp duty, SGST etc., for the start-ups recognised by the State. However, there is a larger scope for improvement on the front of reducing bureaucratic control, proactive engagement of industry, encouraging innovation and reducing the procedural hurdles. The persistence of these issues points out to a policy gap in the State's start-up model. It can be addressed, and a leaf can be taken out of Telangana's modus operandi of its Start-up model.

'Start-Up' Lessons from Telangana:

The Telangna Start-up model is known for its innovative approach towards start-ups and has been receiving applauds from various sections ranging from media houses to policy elite. For instance, the report of the expert committee on Micro, Small and Medium Enterprises, under the chairmanship of the former Director of Securities and Exchange Board of India, Shri.U.K.Sinha had submitted to the Reserve Bank of India in June 2019.Even the expert committee report suggested for a possible replication of the Telanagna Start-up model in other states of the country. A model that had set an example for the whole nation is discussed here under, from which Uttarakhand could contemplate policy action. This would help rejuvenate the existing Start up policy of the State.

The Telangana Start-up Model

Telangana, aims at promoting innovation and entrepreneurship, banking upon its existing base of skilled professionals, technology and research. The innovation policy of the Government of Telangana is based around five broad pillars:

- Developing physical infrastructure & program management capabilities
- Focus on creating sustainable funding models, through funds and other instruments
- Develop human capital, by creating the right environment and support systemsfor learning,
- Experimentation and innovation from the early phases of education.
- Proactive engagement with industry to continuously promote and identify innovation
- Encouragment to start-ups in Rural and Social Enterprise space through additional incentives.

To support these five pillars, Telangana undertook a host of measures by offering fiscal and non-fiscal incentives. For instance, Incubators and Host Institutes in Telangana are eligible for 100 percent reimbursement of the Stamp Duty and Registration Fee paid on sale/ lease deeds on the first transaction and 50percent thereof on the second transaction. In addition to this, start-ups are given various incentives like reimbursement of SGST, where the unit can pay SGST to the department concerned, and avail the reimbursement of the same on a yearly basis. This will be applicable only on the SGST paid to the State of Telangana and for a maximum total turnover of Rs.1 Crore/annum for the first three years of operation. On the other hand, Telangana Government lays special emphasis on promotion of its brand. The State provides reimbursements of 30percent of the actual costs including travel incurred in international marketing through trade shows. However, this incentive will be subject to a maximum of Rs.5 lakh per year per company.

Other Key Features:

One of the key feature of Tealangana's Start-up policy is the reimbursement of patent filing cost, where the cost of filing and prosecution of patent application will be reimbursed to the incubated start-up companies subject to a limit of Rs.2 lakh per Indian patent awarded. In case of awarded foreign patents on a single subject matter, up to Rs.10 lakh would be reimbursed. The reimbursement will be done in 2 stages, i.e., 50 percent after the patent is filed and the balance 50 percent after the patent is granted.

Telangana Government further encourages the start-ups that record a year-on-year growth rate of

15percent, as per audited accounts, by providing

them a grant of 5percent on Turnover, subject to a limit of Rs.10 lakh within a period of three years from the date of incorporation. Even the State offers recruitment assistance of Rs.10, 000 per employee for the first year, in order to promote idea stage companies.

In addition to all the above fiscal incentives, the State Government also provides non fiscal support to the start-ups. The start-ups and the incubators in Telangana are permitted to file self-certifications, in the prescribed formats under various acts and rules, barring inspections arising out of specific complaints. These acts include The Factories Act, 1948, The Maternity Benefit Act, 1961, The Telangana Shops &Commercial Establishments Act, 1988, The Contract Labour (Regulations & Abolition) Act, 1970, The Payment of Wages Act, 1936, The Minimum Wages Act, 1948, The Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959. The entire process is facilitated through the start-up cell of Telangana State. The major challenge in implementation of this policy is the fiscal constraints that Uttarakhand will be facing. This in fact makes replication of all the features of Telangana's Start-up Policy, an uphill task. However it still offers a road map on which, Uttarakhand could contemplate to trek upon. The State could implement the modus operandi of Telangna's start up model in a phased manner, and it can very well begin with the changes in those aspects that do not need fiscal commitments. Bringing in administrative reforms and legislative changes in the State could be a good beginning. It is pertinent to remember in this context, that Start-ups will have a multiplier effect on various segments of the economy, ranging from employment generation to Intellectual Property Rights. Given their strategic importance for the State's growth in general and for the growth of MSME in particular, Telangana's Start- up model is worth emulating, albeit after fine-tuning to the State's ground realities.

4.3.3.3 Technological Upgradation

While flexible labour regime and a proactive start-up policy have the potential to give an impetus to the State's MSME sector, there is a need to bring in convergence between various policies like Technology Upgradation Fund Scheme (TUF)-Ministry of Textiles, IT Policy, Mega Textile Park Policy, Mahila Udhyami Vishesh Protsahan Yojana, Tourism Policy, Electric Vehicle Policy, Ayush Policy, Hill Policy, Mega Food Park Benefits, Aroma Park, Uttarakhand Biotechnology Policy, Uttarakhand Rice Export Policy, Restrictions on Location of Industries, Mining Operations and Other Development activities in Doon Valley (Doon Valley Act), Uttarakahnd Hemp Policy.

In addition to this, equally important is the role of technology and its application. If applied in a right way, it has the potential to bring in paradigm shift in the performance of indicators of MSMEs. The State has a wider scope for improvement on this front and it craves for an effective policy intervention. Thus the third policy gap comes in the form of technological upgradation, where the State could envisage of trekking the path shown by the U.K.Sinha committee on MSME. In its report submitted to the RBI in June 2019, the committee had brought in an innovative concept that is being implemented in various countries across the world. It is Unique Business Identifier (UBI) that is widely being implemented in countries like Newzeland, Georgia, Norway, Jordan, Albania, Canada etc, for multiple purposes. In the context of Uttarakhand, it could be used for streamlining business start-up procedure and improving the tax compliance. Global experience suggests that UBI, supported by an integrated registration system, could improve, business environment, in addition to enabling data sharing and links across multiple agencies. Countries that have adapted this idea have also witnessed a reduced administrative burdens and improving government services. However given the costs and time it takes for this transition, it could be a long run proposition and in fact it has challenges in implementation.

Challenges in Implementation:

The major challenge to implement this policy is the make the MSME sector of the State, to adapt to this new technology, without disrupting the status quo and ensuring a smooth transition. It needs precise planning and executive mechanism and more importantly, there is a need to create a large-scale awareness about this changes. On other hand, the State while making efforts to bring in

this major shift, it could simultaneously envisage of efforts to upgrade existing technology through the Technology Centres by setting up exclusive and customized centres to cater to the needs of basic trades like welding and carpentry and also upgrading the MSMEs, with the latest developments in the fields like battery technology and solar technology. These small steps create an environment to embrace a larger change in the future.

In addition to this, it is worth contemplating the idea of providing incentives to the large enterprises that comes forward to provide guidance and assistance to the State's MSMEs, and help them to adapt and use the latest technology in their respective fields. This would not only reduce the financial and logistic burden upon the Sate in this regard, but also helps the MSMES of Uttarakhand to climb up the ladder of value chain, with a productive human capital.

4.3.3.4 Enhancing Financial Literacy

Last but not the least, the fourth aspect that needs a focused policy attention is the issue of enhancing financial literacy in the State's MSME sector. In fact an important element of enhancing the capability of MSMEs is to make them financially literate, so that they are better positioned to take advantage of the various benefits that the Financial sector can offer them (Report on MSME, 2019). Financial literacy has become increasingly important, given the rate digitalization of processes that MSMEs are put through in their functioning. On the other hand a financially literate can easily understand and estimate the costs and benefits, risks and limitations of the digital transactions one makes in the course of business. This requires, certain competencies and the MSMEs find it difficult to acquire them on their own. It is in this context, the role of the State is predominant, and that could be a facilitator of learning, through creation of awareness in the initial stage and by training in the later stages. The State may contemplate to put in endeavours in imparting these competencies upon the entrepreneurs where learning could take place on aspects related to financial planning, financial services, business management, risk and insurance.

Challenges in Implementation:

The major challenge in enhancing financial literacy among the MSMEs in the State is to estimate the existing level of awareness amongst them. This needs thorough analysis of existing levels of financial literacy of the State's MSMEs before chalking out a plan of action. This exercise would help identify the financial resources, necessary competencies and logistic requirement needed to achieve the target in a time bound manner.

Conclusion:

The State's journey on the front of MSMEs, since the formation of Uttarakhand till date has been commendable. At present there are 53,000 MSME units, with a capital investment of Rs. 10,960 crore, and generating employment to 2,58,000 people. The State envisages to establish 1,70,000 MSME units, with a capital investment of Rs. 36,000crore, that could generate employment to 8,50,000people by 2030. However there are issues that are State specific, and general issues that plague the MSME sector all over the country. The larger state specific challenge is the regional disparities among the hill and plain districts of the Uttarakhand, in terms of number of MSME units, investments and employment generation. These disparities arise due to the structural and institutional issues. While the State has been putting in endeavours to address these issues with appropriate policy intervention, it is time to raise the bar and go beyond these issues, in order to climb up the ladder. A flexible labour regime and a proactive start-up policy on the lines of Rajasthan and Telangana and efforts to improve financial literacy and going for technological upgradation of MSMEs in the State, could take the States' MSME sector to new heights. In fact, this would not only address the economic issue of employment generation but also has the potential address social issues like migration in the State, in the long run.

MATRIX SHOWING LABOUR LAW REFORMS UNDERTAKEN BY VARIOUS STATE GOVERNMENTS

Data as on 14-01-2019

S.No	Name of the Central Act	AP	Assam	Goa	Gujarat	Haryana	Karnataka	Kerala	MP*	Maharashtra	Punjab	Rajasthan	TN*	UK*	Jharkhand	Odisha	West Bengal	Telangana	Chhattisgarh	Bihar	UP	Nagaland	Meghalaya	HP
A	**LEGISLATIVE REFORMS**																							
1	**Payment of Wages Act**																							
a	Notification for payment of Wages in Bank account	✓	✓		✓	✓		✓	✓		✓	✓	**	✓	✓			✓	✓		✓	UC of SG	UC of SG	
b	Compounding for offences introduced								✓												✓			
2	**Factories Act**																							
a	Permitting Night work to women	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓							✓			✓
b	Enhancingthreshold forthedefinition of factory[10 to20 (with Power) & 20 to 40 (without Power)]	✓								✓		✓									✓			
c	Enhancing Overtime Time								✓	✓											✓			
									75 hrs to 125 hrs	**75 hrs to 115 hrs**														
d	Validity of licensefor factories upto10 years								✓				**			✓				✓	✓			
3	**Industrial Dispute Act**																							
a	Enhancingthreshold from 100 to 300 for p rior-permission for lay-off, retrenchment, closure	✓				✓			✓	✓		✓		✓					UC		✓			
														For closure alone										
b	Enhancement in retrenchment compensation				✓				✓			✓												
					45 to 60 days				15 to 90 days			Plus 3 mths wage												
c	Limitation Period forraisingIDreducedfrom 3to1year				✓				✓															
d	Compounding for offences introduced				✓																			
4	**Industrial Employment (Standing Orders) Act**																							
a	Threshold enhanced for applicability of Act								✓			✓												
									From 20 to 50															
b	Exemption from Act to some sectors						✓		✓			✓												
									Micro Indus tries															
c	Compounding for offences introduced								✓												✓			
5	**Contract Labour Act**																							
a	Threshold enhanced for applicability of Act	✓										✓												
b	Time line for registration certificate or license to contractors	✓							✓			✓	✓	✓				✓						
c	Compounding for offences introduced				✓								**											
6	**Trade Union Act**																				UC			
a	Timeline prescribed for disposal of application for registration of Trade Unions [varies from 15 days to 4months]	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓										

S.No	Name of the Central Act	AP	Assam	Goa	Gujarat	Haryana	Karnataka	Kerala	MP*	Maharashtra	Punjab	Rajasthan	TN*	UK*	Jharkhand	Odisha	West Bengal	Telangana	Chhattisgarh	Bihar	UP	Nagaland	Meghalaya	HP
7	**State Shop and Establishment Act**																				UC			
a	Deemed Registration if no action on application instipulated time	✓							✓															
b	Adoption of Model Act									✓			**									UC of SG		
8	**Equal Remuneration Act**																							
a	Compounding foroffences introduced				✓				✓												✓			
9	**Minimum Wages Act**																							
a	Compounding foroffences introduced				✓				✓															
b	Minimum wages tobe paid by chequeorin BankA/C (Section11)	✓			✓				✓			✓							✓		✓			
10	**Sales Promotion Employees Act**																							
a	Compounding foroffences introduced								✓												✓			
11	**ISMW Act**																							
a	Deemed Registration if no action on application instipulated time	✓							✓									✓			UC			
12	**Motor Transport Workers Act**																							
a	Deemed Registration if no action on application instipulated time	✓							✓									✓			✓			
b	Compounding foroffences introduced				✓								✓								✓			
13	**BOCW (RECS) Act**																							
a	Compounding foroffences introduced																				UC			
b	Timelimit of 30 days for registrationcertificate	✓							✓			✓		✓									UC of SG	
14	**BOCW Welfare Cess Act**																							
a	Plant & Machinery of Factory excluded for assessment of cess								✓															
15	**Employees Compensation Act**																							
a	Facilitating filing of claim for compensation				✓							✓							✓					
B	**GovernanceReforms**																				UC			
a	Integration with Bhoomi Suvidha Portal				Under procss	✓			Under process	Under process		Under process	**						✓		UC			
b	Reduction in Number of Registers and Forms	✓			✓				✓		✓		**	✓					✓		✓			
c	Simplification of Registration procedure	✓					✓		✓		✓	✓	✓			✓	✓	✓	✓	✓				
									for 6 Acts				for 4 Acts								✓			
d	Online submission of Returns	✓					✓		✓		✓	✓	✓	✓		✓		✓	✓	✓	✓			
e	Single window/ Online services	✓					✓		✓	✓	✓	✓	✓			✓		✓	✓	✓				
									For 6 Acts	For 20 services			For 12 Acts for 48 services						✓		✓			
f	Transparent Inspection System & exemption from inspection if complies with audit & assessment norms	✓	✓		✓	✓	✓		✓		✓	✓	**			✓	✓	✓	✓	✓	✓			✓

S.No	Name of the Central Act	AP	Assam	Goa	Gujarat	Haryana	Karnataka	Kerala	MP*	Maharashtra	Punjab	Rajasthan	TN*	UK*	Jharkhand	Odisha	West Bengal	Telangana	Chhattisgarh	Bihar	UP	Nagaland	Meghalaya	HP
g	Self certification Scheme		✓		✓	✓	✓		✓		✓	✓	✓			✓	✓	✓	✓	✓	✓			✓
h	Combined Annual Return	✓			✓	✓	✓		✓		✓	✓	**			✓			✓	✓				
C	**OTHERINIT IATIVES**																				✓			
a	Special exemption for MSMEs								✓		✓	✓	✓						✓	✓				
													Exemption from inspection given to start- ups for 5 years under 6 above Acts											
b	Vo luntary Compliance Scheme						✓		✓		✓	✓		✓		✓		✓	✓		✓			
c	Timeline for service delivery	✓					✓		✓		✓	✓	✓			✓	✓	✓	✓	✓				✓
													for 4 Acts											
d	Third Party auditbyempanelledagencies	✓	✓				✓		✓		✓	✓				✓		✓	✓					

*** A P = AND HRA PRADESH, M P= MADHYA PRADESH, T N =TAMIL NADU, U K=UTTARAKHAND, UP=Uttar Pradesh, HP=Himachal Pradesh**

**** UC meansUnder Consideration**

Source: ***https://labour.gov.in/sites/default/files/Labour_Law_Reforms14-01-2019.pdf***

4.4 Ease of Doing Business: Progress, Challenges and Policy Lessons

"Always Deliver More than Expected"

-Larry Page, Co-Founder, Google.

Abstract

Uttarakhand is making new strides on the front of Ease of Doing Business by improving its performance on various parameters of its assessment. Currently, it tops the list of EoDB among all the hill states in the country, which in itself speaks volumes about the amount of endeavours have been poured in, to achieve this status within a short span of time. Despite these achievements, Uttarkhand still faces challenges on the front of EoDB. The present chapter brings forward the achievements as well as the challenges ahead on this front and provide policy suggestions.

It highlights the need to identify the underlying fault lines that are responsible for the large gap between the State's scores of feedback and reform implementation and throws light upon the ground level issues related to the existing Single Window System of the State. It calls for a more reformist approach towards the Single Window System by bringing down the number of procedural hurdles, by drawing lessons from the states like Telangana and Punjab, by explaining how these states could achieve success in doing so. The chapter also brings forward the best practices related to Ease of Doing Business, from the under developed and developing countries across the world, that could offer further policy insights. It calls for the need to understand the importance of the quality of the delivery of investor services, given the fact that the assessment of the Ease of Doing Business is going to be purely based on the feedback from the stakeholders. It suggests for necessary policy interventions on priority a basis, in order to sustain and improve the present rankings of the State.

Introduction:

India has been making its mark in the rankings of the 'Ease of Doing Business' (EoDB). It made remarkable progress on this front in the last five years, by making a leap from 142nd rank in 2014 to 63rd position in 2019, according to the World Bank's Ease of Doing Business Rankings. Even the EoDB has occupied the centre stage of the policy discourse at the state level, ever since the launch of the 'Make India' by the Union Government, and Uttarakhand has been making steady progress on various parameters of assessment over a period of time. It is in this backdrop the present chapter attempts to bring forward the achievements of the State and also discusses the challenges and the way ahead. It is divided into three sections. The first section discusses about the State's journey from innocence to strength on the front of EoDB. The second section brings forward the challenges faced by the State on this front and suggests the way ahead, by bringing in the experiences of Telangana and Punjab, in order to offer policy insights. The third section provides a summary of the best practices of EODB, of various developing and underdeveloped countries for a deeper insight on this front and concludes.

Section-I

4.4.1 Uttarakhand's Progress on the front of Ease of Doing Business

Uttarakhand has been making significant progress on the front of Ease of Doing Business over the years. Department for Promotion of Industry & Internal Trade (DPIIT) along with World Bank initiated the Business Reform Action Plan (BRAP) in 2014-15. These assessments have been done for 2014-15, 2015-16, 2016-17, and 2017-18. While the first two assessments were done only on implementation, the feedback weightage was introduced in 2017-18.In 2018-19, the assessment is going to be 100% based on feedback. Over these years the State improved its reform implementation scores from 13.96% in 2015-16 to 98.10% in 2017-18. In the initial stages, the State was classified under "Jump Start Needed "along with 15 other states in

BRAP 2015 rankings. However, it was recognized as a Leader in the BRAP 2016, thanks to the corrective action and focused approach to remove the bottlenecks identified in the earlier report.

The Business Reforms Action Plan 2016 included recommendations for reforms on various regulatory processes, policies, practices or procedures spread across 10 reform areas spanning the entire lifecycle of a typical business.

01. Access to Information and Transparency Enablers; 02. Single Window, Online Single Window System; 03. Availability of Land, Land Allotment, Property Registration – Enablers, Property Registration; 04. Construction Permit Enablers;05. Environmental Registration Enablers; 06. Labour Regulation Enablers; 07. Obtaining Electricity/ Water Connection; 08. Tax Enablers; 09. Inspection reform enablers; 10. Commercial Dispute Resolution Enablers

4.4.1.1 Major Achievements in 2016

- Recognized as a Leader state by DIPP in its assessment on Ease of Doing Business
- 96.13 % Compliance on parameters used for assessing under the EODB framework
- 100 % Achievement under 7 out of 10 Reform Areas identified by DIPP
- Number 1 amongst Hill States in India
- Most Improved state in EODB Rankings

4.4.1.2 Key Initiatives undertaken by the State Government under EODB 2016

Notification of business-related services under Uttarakhand Right to Services Act, 2011 and the Uttarakhand Single Window Facilitation and Clearance Act, 2012

Availability of comprehensive list of approvals required for setting up / running business on Single Window Portal, investuttarakhand.com

Objective Criteria for land allotment to ensure land parcels are allotted in a timely and transparent manner

Unified building bye- laws for all the regulations governing the construction of buildings Self-Certification for low risk & medium risk buildingsCertification for low risk & medium risk buildings through the creation of computerized risk-based classification Empanelled architects for speedy issue of completion certificates Facility of Auto renewal of Consent to Establish (CTE) & Consent to Operate (CTO) for environmental clearances

Instant approval for Tree Felling based self-certification, in case of exempted tree categories under Tree Protection Act, 1976

Facility of Third-party audit for industries in high and medium risk category & Self- certification for low risk industries

Facility of Third-party certification for boilers & Synchronized and joint inspection under 10 Labour laws

Inspection reforms (Labour Department, Commercial Tax, UEPPCB, HD, Forest etc.) - Inspection report to be submitted within 48 hours, same inspector will not inspect the establishment twice & Random allocation of inspectors / Allocation through jurisdiction Single Integrated return for all Labour laws & 10 Year Renewal for factories excluding hazardous industries

Pre-Establishment / Pre-Operation Services of major departments integrated with Single Window System for Investor Facilitation –Labour, Construction Permits, Environment Clearance, Land Allotment, Electricity & Water Connection, Forest Clearance, Fire NOC,

Land Use Change, Incentives, Public Consultation

www.investuttarakhand.com has an online grievance redressal system for investors which are monitored at government level.

4.4.1.3 BRAP 2017

There were total of 373 points and 71 extended (BRAP+) points covering nearly 30 state departments and 12 reform areas, which are mentioned here under.01. Access to Information and Transparency Enablers 02. Single Window, Online Single Window System 03. Registering Property 04. Construction Permit Enablers 05.Environmental Registration Enablers 06.Labour Regulation Enablers 07. Obtaining Electricity/ Water Connection 08. Tax Enablers 09. Inspection reform enablers 10. Commercial Dispute Resolution Enablers 11. Land Availability and Allotment 12. Sector Specific A total of 46 points were dropped from the evaluation after the rollout of GST. The evaluation was done on the implementation of 373 points while the 71

BRAP+ points were expected to be taken up for consideration by the states separately. These reforms required extended time to implement and impacted the labour policy regime as also Mining, Agriculture, and Hospitality sectors in India.

The methodology for BRAP 2017 evaluation includes 'Implementation', 'Coverage & Usage' and 'Feedback' of the reforms.

The focus for the reforms was on:

Elimination of all offline channels for granting of G2B services Digitization of legacy data

Usage of the systems and new processes related to providing services in prescribed timelines, online systems, self-Certification/Third Party certification, timelines for Inspection report submission. Few other sector-specific clearances are also added such as Mining, Healthcare, Agriculture, Renewable Energy and Hospitality.

4.4.1.4 Reforms undertaken by the State Government under EODB 2017

- Commercial Court setup in Dehradun
- Auto Renewal of Consolidated Consent and Authorization (CCA) facility has been extended to Orange Category industries
- Addition of 40+ investor- related services in "The Uttarakhand Enterprise Single Window Facilitation and Clearance Act, 2012 "
- Integration of Stamps and Registration / Revenue Department /Urban Department to provide the mutation status to applicants
- Rollout of Revenue Court Management System and its integration with Bhulekh software of the Revenue Department
- Developed a Central Inspection System which will be whereby departments will directly report online in the system to enable synchronized inspections and bring transparency. Real time grant of registration and renewal under Uttarakhand Dookan aur Vanijya Adhistam Adhiniyam, 1962
- Online system for filling of Single integrated Returns under Labour Laws
- Mandatory use of E-Step in the module to Schedule appoints for Presentation in SRO offices. Common Application Form for investor -related sectoral incentives applicable in the state real -time tracking of all the offline application of different departments in the state Establishment of Investor Facilitation Centre for investment promotion, industrial facilitation, regulatory reforms and obtaining investor feedback

4.4.1.5 Major Achievements

- Recognized as an Achiever state by DIPP in its assessment on Ease of Doing Business
- 98.10% Compliance in Reform Evidence Scorecard
- 94.24% composite score in Reform Implementation and Feedback
- Topped the list amongst the Hill States in India
- 100% Achievement under 9 out of 12 Reform Areas identified by DIPP

4.4.1.6 BRAP 2018

There were a total of 80 points covering nearly 30 state departments under 12 Reform areas that are mentioned here under.

01 Access to Information and Transparency Enablers 02 Single Window System 03 Land administration and Transfer of Land and Property 04 Land availability and allotment 05 Environment Registration Enablers 06 Construction Permit Enablers 07 Labour Regulation- Enablers 08 Obtaining Utility Permits 09 Paying Taxes 10 Inspection Enablers 11 Contract Enforcement 12 Sector -Specific (Healthcare, Partnership firm, Societies, Trade Licenses etc.)

The focus of the reforms has been on the following aspects

- Elimination of all offline channels for granting of G2B services
- Usage of the systems and new processes related to the following aspects
- Providing services in prescribed timelines
- Online systems
- Self-Certification/Third Party certification
- Timelines for Inspection report submission

4.4.1.7 District BRAP 2018

There are total of 218 points covering nearly 25 departments under 7 Reform Areas that are mentioned here under.

01 Starting a Business 02 Urban Local Body Services 03 Land Reform Enabler 04 Land Administration and Property Registration Enablers 05 Obtaining Approval for Construction 06 Paying Taxes 07 Miscellaneous. The focus of the reforms at the district level has been integrated with the reforms mentioned above, in addition to the regulation of District level functionaries. For 2018-19 the state will be assessed only on the basis of feedback received from the users/industries on these 80 reform points. The result for2018-19 assessment is yet to be declared, as this chapter went to press.

4.4.1.8 Destination Uttarakhand:

The State Government has been working on a mission mode to make Uttarakhand a hub for investments. As a part of these efforts, the State had organized an investor's summit in the name of 'Destination Uttarakhand', from 07-8th October 2018. During the summit, 601 Memorandum of Understanding (MoUs) worth nearly Rs.1.24 lakh crores have been signed. The details of the same have been mentioned in the table hereunder. While it is a commendable achievement to attract nearly Rs.1.24 lakh crores worth MoUs, the State requires to diligently support realisation of the benefits of these MoUs. To achieve this and take them to implementation phase, it is pertinent to understand the underlying challenges and overcome them. The following section discusses them in detail.

Table 4.15:Details of the MoUs Signed During the Investors Summit Held from 07-8th October 2018

Sector	Number of MoUs	Proposed Investments (Rs.in crores)	Prospects of Employment
Power	19	31,543	27419
Food Processing, Agriculture, Horticulture, Dairy, Fisheries and Animal Husbandry	91	7,654	81864
Health Care	71	18,064	60373
Information Technology & Communication	19	5,025	27155
Infrastructure	18	26,909	29360
Manufacturing	233	11,626	51764
Skill &Education	9	6,091	34750
Tourism, Hospitality and Film shooting	119	14,183	29426
Wellness &Ayush	22	3,270	11678
Total	601	1,24,366	353924

Source: Directorate of Industries, Government of Uttarakhand

Section-II

4.4.2 Challenges and the Way Ahead

It is a fact beyond doubt, that Uttarakhand has made commendable efforts in boosting the ranking of the State in terms of Ease of Doing Business. It could make a leap from abysmal performance to the status of 'leader'. This became a reality, due to the tireless efforts of the bureaucracy and a strong political will, which resulted in huge investments flow in the form of MoUs. Due to the extended COVID – 19 induced lockdowns a large number of migrants returning to the state. Many of these returnees may consider investing and setting up their own businesses in the state. Effective EoDB will work as a

confidence building measure between the government and entrepreneurs. However, the reare still certain areas of concern that crave for attention that are discussed here under.

4.4.2.1 The Gap between the Reform Implementation and the Feedback

For the first time feedback weightage was introduced in 2017-18 in the assessment process. In 2018-19, the assessment is going to be 100% based on feedback. The State has been performing well on the front of reform implementation scores, as it improved from 13.96% in 2015-16 to 98.10% in 2017-18.However the major concern is that the latest feedback score, which is only 60.89 percent. This huge gap between the implementation of the reforms and the feedback suggests that there are fault lines in the entire process that are missing from the policy discourse. This difference could be largely due to the emphasis laid upon the meeting of the quantitative criteria setup by the assessor, rather than focusing upon the quality of the delivery of services. Given the fact that the assessment hereafter is going to be purely based on the feedback, the State's ranking may also slip in the ladder in the time to come, if corrective mechanism is not put in place.

4.4.2.2 The Windows behind the Single Window:

Uttarakhand has its Single Window Clearance System (SWCS) in place, where the industries submit their applications/proposals, which are expected to get a reply from the Government within 15 days. In other words, these approvals are deemed to be given if no response is received within 15 days. It appears to be a hassle free process and to some extent it could reduce the need for personal visits of the applicant to various offices of the Government. However there are two issues that arise here. First issue is the number of processes and approvals that the application, submitted in the single window, goes through. Different applications in different formats result in piling up of procedural hassles and eventually result in inefficiency in the delivery of services. Having a Single Window System in this context will have a little impact on the quality of service, and thus result in poor feedback from the stakeholders. It would be similar to construction of a fly over to reduce traffic congestion, instead of encouraging the usage of public transport. When the procedural traffic is not reduced, single windows may not be effective. The second issue is regarding the 'deemed approval'. For instance if a proposal does not get necessary approval from the competent authority in a stipulated time, it is deemed to be approved. However the ground reality is that when an investor approaches a financial institution with his 'deemed to approved' proposal, the chances of his proposal getting the funding are minimal, given the functional aspects of the financial system. Hence instead of having a 'deemed to approved' provision, faster approvals are needed and there is a need to fix the accountability on the officials concerned for the delays in the approval and also incentives for those who meet the targets. This 'stick and carrot' approach would yield better results.

In addition to this, there are also other challenges like land availability and allotment., environmental clearances, lack of information at the district level, number of applications filed vs number of applications finally approved, migration from hilly areas, development only focused to plain areas, lack of market access and financial linkages for small scale industries. Given the wide range of challenges there is a need to learn from the experiences of other states and know how they could tackle such challenges.

4.4.2.3 Policy Lessons from the Experiences of Telangana and Punjab:

The nature of challenges that Uttarakhand faces today on the front of Ease of Doing Business were once faced by the states like Telangana and Punjab. However they confronted them with innovative ideas, which in the later period yielded better results. Uttarakhand could draw policy lessons from Telangana's modus operandi of its Single Window System. It has the Telangana State Industrial Project Approval and Self-Certification System (TS-iPASS), which ensures that all clearances processed parallely. On the other hand they were able reduce the number of documents/ enclosures required, from 110 to 9. This made the process of approval hassle free and increased the efficiency of the services. On the other hand, accountability has been fixed over the official concerned, for the delays in the approval, and penalties are imposed for the non-compliance. The processing is also made through end-to-end interactive online approval system. The unique

feature of Telangana's Single Window System is the presence of an 'Industry Chasing Cell 'in Hyderabad, headed by the Principle Secretary to the Chief Minister. This cell ensures the timely sanction of approvals, by following them up and also monitors the entire process. Uttarakhand could contemplate on setting up such a cell, which could go a long way in speeding up the approvals.

Even Punjab's Single Window System also offers key lessons that could be implemented in Uttarakhand. Punjab has been successful in bringing the clearances of various departments under one roof. It could achieve this by bringing the clearances of various departments under the administrative control of one office, where the officers belonging to the parent departments but posted at 'Invest Punjab' were given the Concurrent powers. Moreover, The Government of Punjab has been successful in bringing out a common application form for various types of approvals related to establish or commence operations. This feat could be achieved by identifying various approvals applicable to various industries, at different stages of setting up of project and their inter relationships. The whole process was enabled by conducting a detailed study with all member departments to identify applicable clearances, their serial & parallel requirements/requisites, documents/forms involved, statutory fee applicable and approval templates.

In addition to these endeavours, Punjab developed an end-to-end digital solution for all stake holders- Investors & Member Officers. The State was able to do it, by designing and implementing the work flow in different stages by a dedicated team of 'Invest Punjab', NIC and also by considering the feedback of the users on a continuous basis, supported by regular reviews from the top management. The unique feature of Punjab's modus operandi is to have a dedicated Relationship Manager in place, for every investor, which made a huge difference in the delivery of services. The State could contemplate replicating the modus operandi of Punjab in order to improve the business environment of the State.

Besides these two states, there are various developing and under developed countries across the world, whose best practices offer deeper policy insights into improving the performance on the front of Ease of Doing Business. They are discussed in detail in the following section.

Section-III

4.4.3 Best Practices across the World:

The World Bank has compiled a list purely based on the improvements across 10 different regulatory areas related to ease of doing business. Instead of using the data published in 2018, the improvement in the respective scores of the countries has been computed by using comparable data that capture data revisions and also taking into consideration, the methodology changes when applicable. The choice of the most improved economies has been determined by the largest improvements in the ease of doing business score among those with at least three reforms. The best practices of such improvers in Ease of Doing Business are given hereunder, from which Uttarakhand could draw lessons and to improve its performance.

Republic of Azerbaijan, a tiny landlocked country in the cross roads of Eastern Europe and Central Asia, achieved remarkable progress in four key areas of the Ease of Doing Business. First it made the registration of property easier and faster by resorting to mapping and registration of each private property in its commercial hub cum capital, Baku. The country also accelerate the registration process further, by speeding up the real estate procedures and also improving the land records. Secondly, Azerbaijan improved upon the protection of minority investors segment, by imposing liability on the directors for unfair transactions. Even in case of any commercial dispute the parties involved could file their respective file summons online and also receive financial incentives for pursuing the mediation. In addition to this, the country's efforts towards making credit easily accessible and also measures to improve the contracts enforcement helped it to be a performer on the front of Ease of Doing Business.

Bahrainimplemented a sleuth of reforms in nine out of the ten areas that are used as a criteria for deciding the score of ease of doing business. These reforms include the measures like introduction of a new electronic system for property registration, introduction of dedicated venues for the commercial dispute resolution, accelerated by the electronic service of the whole process. The country also adapted a new regulation related to insolvency, which provides the choice of reorganization and protections for secured creditors during an automatic stay in reorganization proceedings.

Bangladeshoffers key lessons, where it took easy but effective steps to make it easy for the entrepreneurs to start a business, and to get access to the credit, supported by the Bangladesh's credit information bureau. Obtaining an electrical connection has also been made easy and in its capital Dhaka, the security pc deposit for a new connection has been halved. In addition to this, the country also reduced registration fee calculations based on share capital and also completely abolished the digital certification fees and in fact lowered the name clearance fee for new company registration, thus getting a place in the improvers list.

Chinais another example where it brought reforms in in eight areas. In its capital Beijing, obtaining the company seal is now fully integrated into the business registration one-stop shop. On the other hand, China further simplified the process to obtain a construction permit. It could do this by providing exemptions from few reporting requirements, to the low risk construction projects. In addition to this, applications can now be made through online mode there and even customers can sign electronically on their supply contract. The country also strengthened the protection of minority investors, by imposing a liability on controlling shareholders for any unfair transactions with the interested parties. It also improved the clarity over ownership and control structures.

Kenyaimproved its ease of doing business by bringing in reforms in areas relating to credit accessibility, getting electricity connection, resolving the insolvency, minority protection and getting construction permits. For instance, transparency was brought in construction permits by reducing the fee and posting the permit requirements online. Kenya could improve the reliability of the electric grid in Nairobi by making investments in the substations. Even on the front of minority investor protection, Kenya made new strides by passing legislation in 2018, which gave the shareholders, the ultimate authority over the election as well as the dismissal of the external auditor.

The Kyrgyz Republic, a tiny, mountainous, landlocked, Central Asian country made improvements in the areas of credit accessibility, getting electricity, and tax payment. Monitoring of power outages was enhanced and infrastructure was modernized to reduce power outages. On the other hand the country's credit bureau had started providing credit scoring systems to the financial institutions and banks, in order to improve their lending decisions.

Myanmarimproved its business environment by taking five initiatives. The country strengthened the quality control in construction in its largest city, Yangon. It could do so, by imposing stricter qualification requirements for architects and engineers and also through investments in the sanitation infrastructure. On the other hand, Myanmar launched an online company registry platform. This merged several procedures and also reduced the need for in-person interaction. The country also made the property registration faster by streamlining the deed registration and appraisal. In addition to these measures Myanmar courts started publishing the performance measurement reports. Other reforms include the strengthening of minority investor protection through a new company law, which mandates greater disclosure of transactions with interested parties. This increased the director liability and requiring greater corporate transparency.

Nigeriacould improve on the front of starting business by making it easier than earlier. For instance, it operationalized a new electronic platform, which basically integrated the Corporate Affairs Commission (CAC) and tax authority. The CAC eliminated the need to appearin person, by upgrading its name reservation platform and by putting in place, an electronic platform for registering business

premises online. Land administration was made more transparent in Nigeria's largest city, Lagos, by following the digitization of cadastral plans in a geographic information system, whose digital copies were also posted online. By allowing the certified engineers to conduct inspections for new connections, the country made getting electricity easier. Certain initiatives also made commercial litigation of smaller cases more efficient. For instance, practice directions were issued for small claims courts, introducing pre-trial conferences and limit adjournments.

Togo, a small West African nation has been performing well in improving its regulations related to business, particularly in five areas. It made easy to start a business in Togo, by eliminating the condition of a mandatory requirement that a limited liability company should have their articles of association drafted by a notary. The country also improved transparency in the construction permits by mandatory posting of the pre-approval fee, and other requirements documents online. The cost of new electricity connections got easier and thus helped to bring down the cost of new connection works. In addition to these measures, the property transfer registration process was streamlined, where the registration fee payment and the submission of land transfer documents are completed in a single step and at the same office. The country also improved the access to the information related to credit, by expanding the coverage of the credit bureau by distributing the data from utility companies.

Uzbekistanmade the investor protection easier, by making amendments to its company's law, which mandated the requirement of independent board members and also by strengthening the audit committees. It also made the payment of taxes and enforcement of contracts easier.

Zimbabwebrought in regulatory improvements in five areas. Starting business has been made easier by decreasing the Harare Municipality business licensing fee and by improving online name search. On the other hand, approval of the construction permits has been made faster by conducting frequent sessions of the municipal building commission in Harare. Similarly, an internal tracking system has been implemented by the deeds registry. This helped the applicants to track their applications throughout the property transfer process. Zimbabwe also introduced a new reorganization procedure that allowed creditors to vote on the reorganization plan, granted debtors the possibility of obtaining post-commencement finance and also improved access to credit by giving secured creditors, an absolute priority during insolvency proceedings.

4.4.3.1 Conclusion:

Uttarakhand is making new strides on the front of Ease of Doing Business by improving its performance on various parameters of its assessment. Currently it tops the list of EoDB among all the hill states in the country, which in itself speaks volumes about the amount of endeavours and political will that has been poured in to achieve this status within a short span of time. Despite these achievements Uttarkhand still faces challenges on the front of EoDB. The fact that there is a large gap between the scores of feedback and reform implementation suggests that there has been fault lines, underlying its success and highlight the need to bring in reforms in the existing Single Window System. There is a need for the State to understand the importance of the quality of the delivery of investor services, given the fact that the assessment of the Ease of Doing Business is going to be purely based on the feedback from the stakeholders. Hence the present rankings of the State could be sustained and improved in the years to come by addressing these issues through policy intervention and drawing lessons from the experience of other successful states on this front. To summarize, it is pertinent that while the **State is documenting whatever it does, it is equally important to do whatever it documents**. This would go a long way in not only improving the EoDB rankings of the State but also make Uttarakhand a preferred destination for investments in the future.

4.5 Renewable Energy: Scope, Challenges and the Way Forward

"We will make electricity so cheap that only the rich will burn candles."

-Thomas A. Edison

Abstract

Uttarakhand is blessed with natural resources to support the production of renewable energy through optimal usage of solar, wind, micro hydro power, biomass, biogas resources. While the State has been making endeavours in achieving progress on this front, there are challenges on the way such as higher costs, access to credit, and clouds of uncertainty caused by sector specific issues and also due to policy changes effected resulting from judicial interventions, lack of availability of necessary skill sets, lack of robust institutional mechanisms, inadequate infrastructure and investments. A paradigm shift towards qualitative improvement on all these fronts requires responsive policies addressing specific issues hindering progress in each sub sector of renewable energy in the State. Robust intitutional mechanisms are essential to concurrently monitor and supervise progress in each segment of renewable energy in the State and provide timely feedback,.

It is in this context there is a need to focus on strengthening the research and development capabilities in the State that could further foster advancements in technology through innovations in this arena. On the other hand there is a need for continuous evaluation of the economic effectiveness of the policy instruments applied to achieve growth in renewable energy segments. It is worth considering the criteria of the International Renewable Energy Agency (IRENA), for evaluating the impact of policy instruments towards accelerated deployment of renewable energy sector. This necessitates policy focus on parameters like efficiency, effectiveness, equity, institutional feasibility and replicability. The State needs to envisage its future course of action on the front of renewable energy, and bring in adequate policy changes in these lines to put Uttarakhand in the top in production and conservation of renewable energy.

Introduction:

Renewable energy has been gaining prominence among the policy circles across the world, due its efficacy in countering climate change and given the costs, and environmental impacts associated with the conventional sources of energy. On the other hand the commercial viability of wind and solar power had ushered in a new enthusiasm among the policy makers to lay more emphasis on the renewable energy sector. As a result there has been a growing enthusiasm in looking into the economic, technical and environmental challenges that surrounds this sector, in order to search for viable solutions and ensure energy security that is clean and sustainable.

India has been making endeavours to reorganize its energy mix in favour of green energy sources. As on September 2019, India has an installed power generation capacity of 357,875MW, of which around 22%, or 80,000MW, is generated through clean energy projects. In fact it has become one of the top renewable energy producers globally, with ambitious capacity expansion plans to achieve 175GW by 2022 and 500GW by 2030, as part of its climate commitments.

Given this backdrop, it is pertinent to note that Uttarakhand has a large scope for the production of renewable energy, given the resources available in the State. It has got ample opportunities to make use of the solar, wind, micro hydropower, biomass and biogas resources, which fall under the category of renewable energy. On the other hand, the State's rich base of natural resources like glaciers, rivers, water streams, and forests offer sufficient supply of inputs. While renewable energy is advantageous in providing electricity to

the remote locations of the State through off grid systems, it also plays an important role in employment generation, given its requirement for various segments like operations, maintenance, research and development. In this backdrop, this chapter aims at understanding the scope and challenges for renewable energy in the State and is divided into two sections. The first section discusses the prospects, possibilities and challenges for the production of renewable energy in Uttarakhand from each resource and suggests the way ahead. The second section discusses the challenges faced by the renewable energy sector and provides policy suggestions to overcome them and puts forward the future course of action.

Section-I

4.5.1 Future Energy Resources for the State & Scope of Renewable Energy

4.5.1.1 Solar Power:

Solar power is one of the cheapest forms of renewable energy. In fact the Solar Photovoltaic (SPV) systems have proved very viable across the country. Sunlight is transformed into electricity by the Photovoltaic (PV) cells and it can also be stored in batteries for later use. The PV systems are being used across the country in the rural electrification programme.

The State had released its Energy Policy (Revised) - 2018, according to which, the establishment of solar power plants up to 05 MW has been reserved for the residents of hilly areas in Uttarakhand. This policy is expected to increase employment in the hilly areas and prevent migration. Under this initiative, a total of 202 MW of combined capacity projects have been allocated to 283 developers till date. In addition to this, as a part of promotion of solar energy, 12,000 solar lights have also been installed in remote locations of the State, with the collaboration of Ministry of New and Renewable Energy (MNRE), Government of India.

State's Solar Energy Targets:

On July 26, 2019, the allocation letters for 148.85 MW solar power project worth Rs.600 crores have been issued to 208 entrepreneurs. Other projects with a capacity of 52 MW with an Rs.200 crores will be also be allocated. This is expected to provide employment to 850 people and generate an annual income of Rs 66.50 lakh per entrepreneur. Table no. 4.16 provides a comparison of Uttarakhand with other hill states, in terms of solar power supply

Table 4.16: Comparison of Uttarakhand with Other Hill States, in Terms of Solar Power Supply (Data up to June, 2019)

S.No	Hill State	Supply in MW
(1)	(2)	(3)
1	Uttarakhand	254.56
2	Jammu& Kashmir	16.37
3	Himachal Pradesh	25.43
4	Manipur	3.12
5	Meghalaya	0.12
6	Mizoram	0.66
7	Nagaland	1.00
8	Assam	29.34
9	Arunachal Pradesh	5.39

Source: Department of Economics and Statistics, Government of Uttarakhand

Uttarakhand tops the list in terms of the supply of solar power, with 254.56MW, while Himachal lags behind with 16.37MW. On the other hand the other northeastern states are also far below the performance of Uttarakhand on this front. Besides being the cheapest source of energy, solar power has been been economical in term of maintenance. This is due to the fact that the solar panels once installed at their maximum efficiency require little maintenance. This is the reason behind their success in connecting remote locations. However the bigger challenge for the solar power in the State is, changes in the weather conditions and the possibility of the shading of the Sun. In order to overcome this issue, there is a need to set up an integrated power plant. This not only assures a continuous power supply but also helps to even out the power fluctuations.

4.5.1.2 Hydro Power:

The total capacity of hydropower projects in the State is 24,551 MW, out of which 3,957 MW is under construction, while for 2,357 MW, DPRs have been approved. The State is making efforts for the establishment of Small Hydro Power Schemes. Under the Small Hydro Electric Project,

power supply is expected to start, after completion of the installation of 200 KW capacity Hafla Small Hydro Power Project in Chamoli District, 50 KW Sela, Small Hydroelectric Project Pithoragarh.

A Memorandum of Understanding was signed between UJVN Limited and the Centre for Alternative Water Energy, Indian Institute of Technology, Roorkee for research and development of surface electric turbines, in which surface turbines would be installed in canals. The development of surface water projects does not require permanent structures nor they cause any damage to nature. The major challenge for hydropower is the seasonal variability in the availability of water resources depending on weather conditions of the State. The availability is high during April to September and slows down during October to March

4.5.1.3 Bioenergy:

It is a form of renewable energy resource, which is derived from organic matter like forest residues, agricultural crops and wastes, wood waste. The extraction of energy from biomass is split into three categories - solid biomass, biogas, and liquid biofuels. Solid biomass includes the usage of crop residues, trees, industrial or household residues for direct combustion to provide heat. Basically biomass can be divided into two categories - woody biomass and powdy biomass. While material like corncobs, mulberry stalk, cotton stalk and firewood falls under the category of woody biomass, other materials like rice husk, sugarcane trash, bagasse, straw sawdust etc. comes under powdy biomass. It is also called as fine biomass. Uttarakhand has a rich resource base for the production of biomass with one of the richest forest covers in India.

The State is making endeavours to take advantage of the natural resources available, in the production of biomass. As a part of these efforts, two briquetting plants of 1060 kilowatts of combined capacity have been allocated to private developers under the Pine Needle and Other Biomass Based Energy Generation Policy-2018 in the State. The State has implemented Pine needle and other biomass based energy production policy. Under this policy, 21 projects have been allocated so far. It is envisaged to set up six thousand Pirul plants in the State. This initiative is expected to provide direct and indirect employment to about sixty thousand people. There is further scope to improve the production of biomass through systematic collection of biomass from the wild life sanctuaries in the State and also establishing a mechanism to collect, segregate and process the powdy biomass in the State. If this could be done at local/block/district levels, it would reduce the logistics cost and making its production more viable and economical

Biogas & Bio fuel:

Biogas is another option that the State could envisage to focus upon. Biogas is produced through a process called anaerobic digestion, where the wet organic biomass like food waste, animal dung, and human sewage are degraded in the absence of oxygen, using bacteria. This process eventually produces biogas, which is a combination of Carbon dioxide and Methane. The dung from two to four cows can produce enough biogas for cooking for one household and remaining can be utilized for electricity production (Chauhan & Saini, 2015). Given the large scale growth of dairy farming in the hilly areas of Uttarakhand, it offers a wide scope for the production of bio gas in the villages of the State, which would not only provide them energy that is clean, but also economical. It also helps the local communities to be involved in the process, and results in community engagement. The study by Chauhan & Saini, 2015, suggests that biomass-based distributed generation (DG) systems helps to build a localised system based on modular technology that uses indigenous fuels and also helps to avoid transmission and distribution losses. It also highlighted the fact that the decentralised power generation systems based on biomass, implemented in India, have demonstrated technical and operational feasibility as well as acceptance by local communities, while its economic viability is yet to be demonstrated.

Biofuels is another form of bio energy that is obtained by processing plants, plant seeds or fruits. Oil seeds, sugarcane and nuts used for extracting biofuel, by applying scientific methods of extraction. Generally, pressing or fermentation is used to produce oils or ethanol from industrial or commercial residues such as biogases or from

energy crops grown specifically for this purpose.

Biogas also emits lesser Carbon dioxide and thus it is eco-friendly. However the major challenge with biogas its plant require larger space for installation and the capital requirement is also higher. However it is advantageous over wind and solar energy, as the resources required for the production of biogas and biofuel could be available all through the year, irrespective of seasons, whereas wind and solar power depends upon climatic conditions and varies with seasons.

Wind Energy:

Uttarakhand, with its low-pressure belts and a mean annual wind speed of 5–5.5 m/s in some places of the State, has a good scope for the production of wind energy. Windmills have a life span of nearly twenty years and they are also energy efficient. In fact setting up of wind energy plants brings along with it, ample employment opportunities in segments related to installation, manufacturing, operation and maintenance of wind turbines. Seasonal variations in wind and the requirement of large scale working capital, relative to the other sources of renewable energy are the challenges faced by wind energy in the State. Another major challenge that the wind energy segment faces in the State is - location. Due to the hilly terrain of the State, there are few locations that are suitable to harness wind energy. This in turn makes it mandatory to have lengthy transmission lines from the point of production to the place of usage. In addition to this, stability and control issues with large wind farms are other major challenges that need to be faced.

Section-II

4.5.2 Challenges and the Way Forward

While renewable energy sector offers a wide range of advantages ranging from clean energy to creation of employment opportunities, it also faces several challenges. They are discussed hereunder.

4.5.2.1 Higher Costs:

The first challenge is economic in nature. It is a fact that despite many merits, the renewable energy sector needs higher initial costs and larger capital requirements. Risk factors are relatively higher in terms of returns on investment, relative to the traditional forms of energy. The State could envisage policies directed towards provision of higher incentives and subsidies in order to promote renewable energy generation and usage in Uttarakhand. In this context, going for Generation Based Incentives (GBI) could yield better results, as it is an output-based incentive and there is lesser scope for misuse. In addition to these efforts, non-financial incentives are also equally important. It is in this context it is worth considering the recommendations of the Niti Ayog's expert group report on RE by 2022. It calls for a provision of non-financial support options for the renewable energy sector like policy support, legislative enablers, project development and a coordinated implementation eco system. The committee also suggests that the renewable energy tariff at the procurement end should reflect all the financial and non-financial incentives.

4.5.2.2 Access to Credit:

Access to credit is the second challenge faced by the renewable energy sector. Banks and financial institutions have a larger role to play in provision of credit assistance for the enterprising individuals or institutions to take up projects in renewable energy. However, due to the risk perception of investments in this sector, credit access poses a major challenge. The State may contemplate policies that exclusively focus upon lender awareness programmes, where the lending agencies are made aware of the nature, scope, characteristics and the specific requirements of renewable energy projects. This initiative would help reduce the risk perceptions among lenders, and assist them in taking informed decisions on lending. Eventually it will help the entrepreneurs to have better credit terms.

Particular segments of renewable energy like wind energy requires significantly high levels of working capital and bank interest rates are higher for this segment. It is in this context the schemes like interest rate subvention schemes could be adapted in order to reduce the burden and it need to be applied to specific projects, that uses high end technologies that are costlier and require large scale working capital.

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4.5.2.3 The Clouds of Uncertainty:

Uncertainty is the third challenge faced by the renewable energy in the State. This has two facets in Uttarakhand. First facet is the supply side uncertainty, where there is volatility in the supply of resources like wind and solar energy, due to changing climatic conditions, particularly in the hilly districts of the State. Maintaining grid discipline with the application of scientific techniques to predict the availability of power could help reduce the uncertainty.

The other side of the uncertainty is largely related to the environmental policies and legal interventions that come into play. For instance, 24 hydropower projects in the Alaknanda and Bhagirathi river basins, with a total capacity of 2,945 MW have been stopped due to the decision given by Hon'ble Supreme Court in Civil Appeal No. 6736/2013.In addition to this, the declaration of the area from Uttarkashi to Gangotri as Eco-sensitive zone by the Ministry of Forest and Environment, Government of India, has halted the proposed 16 hydropower projects in that area, with a total capacity of 1,743 MW. These two cases are instances that call for due diligence and meticulous efforts in design of policies in such a way that they would stand judicial scrutiny and also avoid any clash with the existing environmental laws of the country. It would help avoid delays in implementation of projects and avert financial loss due to uncertainty.

4.5.2.4 Skill Set

The fourth challenge is the availability of skilled personnel to take the renewable energy sector to the next level in the State. It needs creation of pool of experts with necessary scientific temper, who could skillfully handle the renewable resources. Creation of skilled professionals related to renewable energy management, requires policy initiatives aimed at offering certificate courses that are designed exclusively for this purpose, in the Government institutions of learning, with a guarantee of employment. The curriculum and courses need to be designed to meet this requirement, besides providing training for the trainers. Affiliating with professional institutions in India and abroad to serve the purpose could help to bring in qualitative change in the skill sets development in the renewable energy sector. It could be started as a pilot project initially, and later can be scaled up across the State. In addition, citizens could be imparted training on renewable energy resources, which could further enable them to use the renewable resources judiciously. Inclusion of women in large numbers in such training programmes could make them a renewable energy work force promoting inclusiveness.

4.5.2.5 Institutional Mechanisms:

The fifth challenge that the renewable energy sector faces in the State is the lack of dedicated institutional mechanisms to regularly monitor, supervise and control the activities related to renewable energy resource management. This calls for a need to have a supervisory mechanism, based at grass roots level, with village as a unit that helps to assess the availability of renewable energy resources in the State. Once there is clarity of availability of renewable energy resources, its usage could be planned and executed in a systematic manner, thus promoting effective usage of financial resources, which could be dedicated for the same. It is equally important to have an institutional mechanism in place to disburse financial assistance and also to monitor the progress of implementation of Government policies related to renewable energy sector.

4.5.2.6 Infrastructure:

The NITI Ayog's report on India's Renewable Electricity Roadmap, 2030 had reiterated the fact that renewable power may remain unutilised in the absence of a proper transmission network and poor grid discipline. In fact glitches in the infrastructure increase production costs and thus makes this sector less viable. In order to make the renewable energy more viable, there is a need to have an adequate and updated grid infrastructure. The State could contemplate to initiate policies that lay more emphasis on the promotion of renewable and hybrid power projects, which could be potentially a viable alternative to the thermal and hydropower.

A hybrid system is a combination of two or more energy conversion devices, or two or more fuels that when integrated, overcome their respective inherent limitations. In addition to this, endeavours to bring in transparency in communication to developers about the status of

major transmission projects on a regular basis, and making efforts to bring in hybridisation of wind and solar plants and attracting investment in transmission segment would go a long way in addressing the issues related to infrastructure of renewable energy.

4.5.2.7 Investments:

The disaggregated nature of the market for renewable energy, small transaction size and the permits required to setup renewable energy plants, are some of the barriers for higher investments required for financially viable projects. In this context it is pertinent to take measures to improve the business environment, and provide assurance to the investors, given the risks involved at multiple stages of renewable energy generation, transmission and distribution. During the Investors Summit held from 07-8th October 2018, 19 MoUs worth Rs. 31,543 were signed, related to power sector. It is in this context it is pertinent to look at the percentage of investments related to renewable energy sector and take policy initiatives to attract investments specifically related to renewable energy. On the other hand incentivizing the power procurement utilities to buy more renewable energy could increase the demand for the same and thus draw more investments in this sector.

The Future Course of Action

Uttarakhand is blessed with natural resources to support production of renewable energy. Making a paradigm shift towards qualitative improvement on this front requires policies that continuously monitor and supervise the dynamics in the segment concerned. It is in this context, there is a need to focus on strengthening the research and development capabilities in the State that could further foster advancements in technology through innovations in this arena.

There is a need for continuous evaluation of the economic effectiveness of the policy instruments applied to achieve growth in renewable energy segment. There is a need to undertake research on the efficacy of policy enablers and initiatives offered for the promotion of renewable energy sector. In this context it is worth considering the criteria of the International Renewable Energy Agency (IRENA), for evaluating the impact of policy instruments towards accelerated deployment of renewable energy sector. This necessitates policy focus on parameters like efficiency, effectiveness, equity, institutional feasibility and replicability.

The State needs to envisage its future course of action on the front of renewable energy, and bring in adequate policy changes on these lines to put Uttarakhand on the top in production and use of renewable energy.

4.6 Civil Aviation: Prospects, Challenges and the Way Ahead

"It is a bird's imagination, not its wings, that determines how high it can fly"

-Matshona Dhilwayo,Canadian Philosopher

Abstract

Uttarakhand has bright prospects on the front of civil aviation, due its wide variety of tourist attractions. Given the fact that the State is the biggest beneficiary in the country in second round of UDAN, it is imperative to explore the possibilities to widen its coverage. The State has its set of challenges that need to be confronted to succeed on the front of UDAN, where the issue like subsidies, skills, viability play an important role. Models of subsidies can be emulated from states like Madhya Pradesh and Manipur. With respect to the policies related to community participation in connecting remote areas, inspiration could be drawn from Australia's Remote Air Service Subsidy (RASS) model. On the other hand Telangana shows the way for proactive policy initiatives on the front of addressing the skill gaps.

In addition to this, the State has a unique potential for Heli services, given the tourist flow and geographical conditions. While Nepal offers policy insights into pressing Heli services for tourist needs as well as medical evacuations, the State could envisage policies that could create an eco-system that would contribute to the growth of this segment of civil aviation by addressing the challenges like infrastructure, safety and cost of medical evacuations. Effective policy interventions on this lines will not only help the state to reap the potential of Heli Services but also have the transformational capability that could create a sustainable structure, that ensure employment and prosperity to Uttarakhand in the time to come. In addition to this, the State could also envisage to host the cloud servers, taking advantage of the favourable climatic conditions.

Introduction:

India's Civil Aviation is undergoing a phenomenal shift in the last few years. Various factors like the rise of middle class, liberalized regulatory regime for aviation, technological advancements, had contributed to the increasing demand for air travel. On the supply side, the market forces of competition and self-interest are driving the airline service providers to offer cheaper rates of flying to their potential customers. In the whole process the missing link was the regional connectivity across small towns in the country, despite the huge potential it holds for aviation industry. Tapping this potential would create a new era in India's civil aviation and the Government of India had touched the right chords by launching its Regional Connectivity Scheme across the country.

It is in this context, the present chapter aims at discussing at length about the prospects, challenges and issues that could become stumbling blocks on the front of State's progress in UDAN and explore the policy options to tackle them. The present chapter has been divided into three sections. The first section deals with the launch of UDAN scheme and discusses the issue of operational efficiency and profitability of airline service providers. This section also covers the pertinent challenges like subsidies, connectivity to remote areas, viability, skills and infrastructure, which are the major stumbling blocks. The second section deals exclusively with the issues related to operationalizing heli services in the State, given its huge potential to serve the tourists as well as their deployment in medical evacuations. This section explores the prospects of Heli services in Uttarkhand and later discusses the challenges like cost of the medical evac-uations, safety issues and air traffic forecasting. The third section is devoted to deal with the idea of hosting cloud servers in the State and explores the possibilities and challenges in this direction. All the three sections provides policy suggestions to overcome the challenges and put the State's civil aviation on a new trajectory.

Section-I

4.6.1 UDAN: Prospects and Policy Suggestions

4.6.1.1 UDAN scheme

Ministry of Civil Aviation, Government of India had launched the **Regional Connectivity Scheme (RCS)** which is also known as **Ude Desh ka Aam Naagrik (UDAN) on** 27 April 2017.The main objective of this scheme is to make the air travel affordable and widespread in the country. In addition to this, it also aims at boosting **inclusive national economic development**, job growth and air transport infrastructure development of all regions and states of India. Under this scheme, various airlines compete to win subsidies to operate flights that **link small airports with bigger airports** in the country. Before the launch of UDAN, there were only 76 airports in the country, with scheduled commercial flights. However within 15 months of launching of the scheme, work has been initiated to provide scheduled connectivity to 56 unserved airports and 31 helipads across the nation and sixteen such airports have already been operationalized. This scheme is expected to provide scheduled connectivity on approximately 450 unconnected routes in country.

UDAN 2 (Phase 2, 2017) is expected to connect 43 airports and helipads with priority to the Northeast and the hill states of the country. States with a maximum number of airports and helipads, which will see activation under the UDAN 2 scheme, are Uttarakhand (15 airports), Uttar Pradesh (9 airports), Arunachal Pradesh (8 airports), Himachal Pradesh (6 airports), Assam (5 airports) and Manipur (5 airports). Thus, Uttarakhand is the largest beneficiary of this scheme. On the other hand, the two phases of UDAN are expected to generate an estimated 33 lakh RCS seats (airfare capped) through fixed wing aircrafts and 2 lakh RCS Seats (airfare capped) through helicopter operations in a single year. As a result, 35 lakh additional seats will be available to passengers at competitive market prices. As a result of initiatives under UDAN scheme, the scheduled airline operators have been able to build a model that is sustainable and this in turn encouraged the non-scheduled player to commence their operations (Report based on WINGS India, 2018).

4.6.1.2 Challenges and the Way Ahead for UDAN in the State

Given the fact that Uttarakhand is a renowned tourist destination, with a variety of tourist attractions, ranging from pilgrimage to adventure, there is a wide scope for the growth of aviation industry in the State under UDAN. However the key to the success of UDAN in the State would be dependent upon the profitability of airlines that have got the bidding to offer their services in the State. While the State is going to be biggest beneficiary in the second phase of UDAN, reaping and sustaining its potential benefits depends upon the efficiency with which the challenges at the ground level are handled. It is in this context it is pertinent to understand and address them through policy intervention. A detailed discussion on each of such challenge is discussed and policy measures are suggested here under.

4.6.1.3 Subsidies

While the State has provisions to support the operation of airlines under UDAN, the States of Manipur and Madhya Pradesh offer important insights into this issue. In October 2018, the Government of Madhya Pradesh in its `Aviation Policy 2018' decided to provide subsidy to airlines, which operate flights under the Centre's regional connectivity scheme UDAN from airstrips or airports in the State. The subsidy amount will be paid to aviation companies, which are registered under the Centre's UDAN scheme. According to this policy, a subsidy of Rs. 40,000 would be paid to the airline concerned, on every landing of a nine-seater passenger aircraft. In case of a 10-20 seater planes, the subsidy per landing would be Rs. 80,000. This amount would be Rs.1.50 lakh for 21-80 seater aircraft and Rs 2 lakh for those with bigger capacity, respectively. This mode of offering subsidies in the place of providing blanket subsidies to the airlines, irrespective of their total number of landings and their carrying capacity would help to allocate the financial resources effectively and it would even reward the performers, while provides the underachievers to perform better. It is worth considering by the State, to be replicated in Uttarakhand, given its efficiency in the allocation of subsidies to airlines under UDAN scheme.

In addition to Madhya Pradesh, the North Eastern state of Manipur also offers important lessons to the State, on dealing with subsidies under UDAN scheme. In December 2019, keeping in view the long-cherished dream of the Manipur people, to have air connectivity with Myanmar's Mandalay, the Union Ministry of Civil Aviation has assured scheduled flight service between Manipur's capital Imphal and Mandalay under the UDAN scheme, acknowledging the state's importance in the Act East policy. The flight service came into operation after the state's initial commitment to bear the subsidy amount. However financially it is unsustainable and thus the Government of Manipur requested the Ministry of Civil Aviation to include the Imphal-Mandalay sector under the International UDAN scheme. Now, the Airlines are required to bid on the number of seats per flight, for which subsidy in the form of pre-decided pay-out per seat is required under the UDAN scheme. Unlike chartered flights where the rates of subsidy support are fixed arbitrarily on a lump sum basis. The competitive bidding made financial support under International UDAN more economical. This will accrue benefits to the customers, in terms of lesser ticket prices and predictability of the flight's schedules. Given the State's proximity to Nepal, Uttarkhand could envisage Manipur's modus operandi and take progressive steps in this direction.

4.6.1.4 Connecting the Unconnected:

While UDAN aims at connecting the unconnected, the major challenge for the airlines operating in the State is the viability of running the airline services to the remote parts of Uttarakhand. However subsidizing these services needs a model, which could yield concrete results on the ground. In this context, Australia shows the way with its Remote Air Service Subsidy (RASS) scheme to subsidize remote air services in for eligible communities in the country. The objective of this scheme is to ensure that communities in remote and isolated areas have access to scheduled air services for the carriage of passengers and goods. Under this scheme, it is the communities and not the airlines that apply or re-apply to be included in the scheme based on pre-determined eligibility criteria. The community need to present a "demonstrated need for a weekly air service" and evidence of being situated in a sufficiently "remote" location. Then, the operator is selected through a competitive tender process and the Government would provide subsidies to the selected airline on a monthly basis. As a result of this scheme, more than 370 communities in remote and isolated areas of Australia had improved access to air travel, through the subsidy of a regular air transport service.

4.6.1.5 Dealing with the Viability Challenge:

There is a provision of Viability Gap Funding from the Union Government and in addition, there are incentives from the State reduction of VAT to one percent, for the airlines operating under UDAN. However one needs to look for a more fiscally sustainable model in the long run, where the burden on the State shall be reduced over a period of time. This becomes a reality with a sustainable risk sharing and revenue guarantee model in place. In this context, it is worth considering the Deloitte and FICCI report on Civil Aviation, 2018, that underlines the need for community participation in bringing in profitability to airlines business. The report moots the idea of Regional Connectivity Forums (RCF). A RCF would comprise of various stakeholders like airport operators, airline operators, state governments, business clusters, local passengers, and the hospitality and tourism industry. RCF would collaborate and make efforts to promote air connectivity in the respective regions. The report cites the example of establishing a community ticket trust that requires major airline customers in the region to commit to booking a minimum number of tickets during the initial period of a new service. Such a 'travel bank' or 'mileage bank' does not have to cost anything extra, but it is useful in lowering risk. An Initiative like this may work ideally on a B2B or a B2C model, but still it is worth emulating. The large scale disruption of this sector due to the COVID 19 pandemic also requies careful policy planning to create future safeguards against any similar situation arising in the future.

4.6.1.6 Infrastructure:

Infrastructure is another major challenge that the State faces and there is a larger scope for improvement from the present status

Details of Airports/Airstrips in Uttarakhand

S.No	Air Strip /Airport	Runway Length and Breadth
1	Chinyalisour, Uttarkashi	1050 meter and 30 meter
2	Naini Sani, Pithorogarh	1510 meter and 30 meter
3	Gauchar,Chamoli	1200 meter and 23 meter
4	Pant Nagar Airport,Udhamsingh Nagar	4500 feet and 100 feet
5	Jollygrant Airport,Dehradun	2140 meter and 45 meter

Source: Uttarakhand Civil Aviation Development Authority

The State may envisage to attract higher investments in building required aviation infrastructure, which could make new strides and achieve significantly positive outcomes on the front of UDAN in the state.

4.6.1.7 Skill Set:

In addition to the viability challenge, there are issues like skilled manpower inadequacy woes that are stumbling blocks in the way of airlines to exploit the potential benefits that the RCS offers. This issue not just specific to the aviation business in Uttarakhand but also to the entire nation, where the attainment and retention of skilled work force for aviation industry has become a challenging task. To address this issue, State can envisage encouraging setting up of skilling universities and aviation academies, which could be a major source of talent for aviation industry. States like Telangana have been proactive in this regard and they have already signed agreements with United Kingdom based university along with setting up of Telangana State Aviation, which trains more than 400 students per year. Uttarakhand could envisage emulating Telangana experience, which could make the State as a supplier of talent to the increasing needs of UDAN, besides fulfilling the State's aviation manpower needs.

On the other hand the civil aviation holds large potential of employment opportunities, which again needs necessary skill set. A report on the comprehensive skill gap analysis and future road map for skill development in civil aviation (2016) estimates that by 2035, the Indian Civil Aviation sector (across the study segments of Airport, Airlines, Cargo, MRO and Ground Handling) will employ 0.8 to 1 million personnel directly and another 3 million indirectly (for 1 direct job about 3.5 indirect jobs are created), after factoring in the likely improvements in economic output and labour productivity. The report also further states that, for the direct employment opportunities estimated, the airlines segment contributes the maximum share of 32% followed by cargo about 25%, airport at 23% (which also includes contractual staff), ground handling about 17%, and MRO about 3%.

Given the range of employment opportunities that this sector holds, it is pertinent to develop soft skills and domain specific skills. Given this backdrop, the report recommends a five dimensional framework to address the skill gaps. They include, institutional strengthening, infrastructure and capacity building, training process re-engineering, revisiting funding mechanisms, and strengthening monitoring and evaluation. The State could envisage policy actions on these lines, in order to tap the employment potential by making a qualitative improvement in the skill sets of its human resources.

Section-II

4.6.2 Heli Services: The Future of Connectivity

4.6.2.1 Operationalizing Helicopter Services

In order to cater to the needs of the people residing in the hilly areas of the State, Ministry of Civil Aviation (MoCA) operationalized the first-ever helicopter services from Dehradun's Sahastra-dhara helipad to Gauchar, and Chinyalisaur under the Regional Connectivity Scheme – Ude Desh Ka Aam Nagrik (RCS-UDAN) of Government of India, on 8th February 2020. This is in tandem with the objective of the Ministry of Civil Aviation to enhance the aerial connectivity of the hilly areas in the country. The MoCA awarded the Sahastradhara-Gauchar-Chinyalisaur route to Heritage Aviation under the UDAN 2 bidding process. Heritage Aviation will operate helicopter services from Sahastradhara to Gauchar and Chinyalisaur twice daily. For the Heli services, Viability Gap Funding (VGF) is provided under

UDAN to keep the fares affordable for the common people. In addition to this, the State Government of Uttarakhand is also providing additional incentives like reducing the VAT to one percent, in order to make the scheme more attractive. Even 20 percent of the subsidies being given to the airlines under UDAN scheme is being is borne by the State Govenemnt. The services on this route are also expected to boost the tourism sector in the Uttrakhand region and will also assist the Chaar Dhaam Yatra pilgrims as Gauchar is en route to Badrinath and Chinyalisaur is en route to Gangotri in the Uttarkashi district. Furthermore, Pawan Hans Limited (PHL) is also going to commence the operations under UDAN from Jolly Grant Airport, Dehradun to New Tehri, Srinagar (Chamoli, UK) & Gauchar.

4.6.2.2 Prospects of Heli Services in Uttarakhand

Helicopter operations have bright prospects in the State to flourish. The scope for their operations in Uttarakhand is wider, given the geographical factors and terrain issues in the State. In fact given their versatility and ability to fly in varied environments make Helicopter services a more realistic proposition and possibly the best mode of transport, to reach the remote and less connected areas. On the other hand, Uttarakhand is a Himalayan state with a large network of rivers, prone to floods. In addition to this, it has Nepal in its eastern borders and the floods in Nepal also affect the State. Due to this fact, the Fifteenth Finance Commission report has given the highest score to Uttarakhand for being a flood-prone state. Besides this, the State is also prone to natural calamities like landslides, earthquakes and cloudbursts. Given this backdrop, Helicopters offers flexibility in operations and they can be used for immediate deployment, in order to carry out rescue and relief operations in the State. Recently, the State Government, . had taken steps to tap the potential of Helicopter services in the State. As a part of these measures, new helipads have been operationalized, check- in counters have been set up and security arrangements have also been made. The State had deployed Heli services during 2017-2020 for rescue and relief operations in the remote areas of Uttarkashi, Darchula, Gungi and Malpa. In addition to this, 51 helipads have been built in remote areas. Efforts are also in progress to make 'joy ride' available in the form of 'Himalaya Darshan', from the Sahsradhara Helipad.

To explore further scope and opportunities for Heli Services in the state, the country in its eastern borders provides greater insights. Nepal stands as a poster boy with respect to the deployment of Helicopter services for a variety of purposes. It ranges from tourism to medical evacuations. Helicopter services are being pressed into catering the transportation needs and connecting the remote areas of Nepal. Being a landlocked country and surrounded by mountains, air transportation has become obviously the most popular mode of transportation in Nepal. The latest data available with the Government of Nepal suggests that there were 7, 53, 002 and 9, 40,218 visitors entering Nepal in 2016 and 2017, respectively. Of these visitors, 8.83% in 2016 and 8% in 2017 had come for trekking or mountaineering. The adventure tourism's growth in Nepal and the growth of the Helicopter industry have been in tandem for more than three decades. This is due to the fact that Heli services would come handy in evacuating the trekkers and mountaineers in cases of medical emergency and could be an important asset in search and rescue operations.

The success of Heli services industry in Nepal underscores the importance of tourism and their interdependence. Thus Nepal's success story in this regard offers an important lesson to Uttarakhand that it is pertinent to integrate the tourism policy and the aviation policy of the State. With picturesque landscapes, mountains, rivers and distinct combination of cultures, Uttarakhand has a huge tourism potential for adventure and ecotourism. This potential if tapped to its optimal level could give a boost to the Heli services industry in the State, as Helicopters could be the inherent part of last-mile connectivity in the State. Thus there is a need for the synergy of Department of Tourism and Civil Aviation of the State and design the modus operandi to deal with point-to-point helicopter flying, by taking the tourists need into consideration.

4.6.2.3 Medical Evacuations: An Idea whose time has come

In addition to Tourism, medical evacuation has a huge potential to drive the growth of Heli services

industry in the State, given the tough hill terrain and remoteness. Thus Uttarakhand could envisage a model of integrating helicopter services into emergency medical services, with a central dispatch system of Heli services. These services could be supported by trained rescuers, medical and non-medical staff, teams to respond to calls for helicopter rescues, and delivering thesick to an appropriate medical facility. A well-established system in place for the Heli services will cater to the needs of not only tourists visiting the State but also the common public in the remotest regions of Uttarakhand, seeking medical attention. Given the bright prospects of this segment, the State can envisage making endeavours towards realizing its potential.

4.6.2.4 Challenges and the Way Ahead

While tourism and medical evacuations offers a large scope for the growth of Heli services in the State, there are issues and challenges that need policy attention, in order to reap this potential. They are discussed here under in detail.

4.6.2.5 Cost of Medical Evacuations:

Despite the fact that medical evacuations have a large scope in Uttarakhand, it is maybe noted that Heli services for medical evacuation are costly and policy interventions are necessary to make it affordable and accessible. At the policy level, the State Government, in collaboration with the Union Government could envisage including this service under medical insurance packagesso they include the costs of medical evacuations in Uttarakhand. On the other hand, to support the Heli services initiatives, the State could contemplate to encourage the building of roof top helipads on various hospitals, resorts and large hotels across the State, given the space constraints due to hilly terrain. This makes the landings less risky and the medical evacuations would have a higher success rate in terms of saving patients' lives.

4.6.2.6 Safety:

As the heli services industry grows in the State, it is pertinent to address the safety concerns related to helicopters, given the possibility of accidents, particularly during relief, rescue and medical evacuations in remote areas of Uttarakhand. There is a need for making, implementation and supervision of the standard operation procedures, jointly by the Uttarakhand Civil Aviation Development Authority (UCADA), State Disaster Relief Authority (SDRA).In addition to this, making a database consisting of the State's terrain maps, with a proper identification of obstacles like cable, wire, electric pole, and pylon, etc. could help avert the accidents of Helicopters. In addition to addressing the safety issues, there is a need to create right infrastructure in order to accelerate the growth of helicopter operations, besides going for a periodical review of the existing helicopter network in the State. This would help in identification of new helicopter corridors and to update the existing structure in line with the needs of customers and the industry.

4.6.2.7 Air Traffic Forecasting:

Tourism is the biggest source of demand for Heli services. However, given the seasonal nature of tourism in the State, it is pertinent to forecast the possible air traffic and demand for heli- services in the State. It is in this backdrop, there is a need to have a synergy between various stakeholders like tourism associations and transport-planning agencies and the tourism department of the State along the Civil Aviation department. Joint endeavours need to be made to have a database of tourist demand segregated into daily, weekly, monthly and annual cycles. This data would help forecast the demand for heli services in the State and thus helps in proper planning and preparation to cater the growing needs of the customers.

Section-III

4.6.3 Tinkering with Cloud Servers: Prospects and Challenges

The term 'cloud' in general, is used to refer to several servers connected to the Internet that can be leased as part of a software or application service. The Cloud-based services include services like data hosting and sharing, web hosting, and software or application use. Cloud Computing is a mechanism where complex processes are distributed across multiple smaller computers, in the place of a single machine, which is powerful. Here many servers that are linked with each other share the load. These distributed resources act as one and they are called federated storage clouds. Due to this mechanism of data distribution, the cloud is very tolerant with respect

to faults and its usage could potentially reduce the creation of different versions of files, due to the shared access to documents, files and data. On the other hand, a cloud server is basically a virtual server, running in a cloud-computing environment. It is built, hosted and delivered via a cloud-computing platform via the Internet, which can be accessed remotely. A Cloud server will have all the necessary software requires to run and it can function as an independent unit. The usage of cloud server has multiple benefits. Unlike physical servers, a cloud server offers security and stability and speed to the user due to the isolation of software problems being isolated from the user's environment. More importantly, the hardware issues that are common in physical servers can be avoided and this would bring down the IT budget significantly. In addition to this, the cloud server has the benefit of speed in comparison to physical servers. Even in terms of affordability, the cloud servers fare better as they are easy to upgrade and the disk space and memory can be added quickly without hassle, unlike the physical servers.

4.6.3.1 Cloud Servers and Airlines:

Cloud computing has a wide range of benefits in the airline industry too. It could be used for a variety of purposes that includes estimation of travel times, emission controls, identification of aircraft, integrating fare management and traffic modelling. In addition to this, cloud computing also provides a highly accessible infrastructure to the airlines. It helps the airlines to keep their crucial systems running, where they can not only have the data backup but can remain assured of its safety, by storing it in multiple locations and can even monitor the status of their data backups. The companies can meet their demand for computing and storage resources, either by building private Data Centres (DCs), or by offloading applications and services to external cloud providers. Thus, given the increasing competition in the airline industry, adapting cloud technology could bring large scale benefits, by bringing down operational costs, which in turn makes the operations viable in the short run and profitable in the long run. This makes running the airline services in the State more viable and profitable, which in essence is the need of the hour to realize the objectives of the UDAN scheme and make it successful. It is in this context it is to be remembered that around eight regional airlines have ceased their operations across the country in the first two years of UDAN scheme, owing to high operational costs. This underscores the importance of bringing down the operating costs and the idea encouraging the airlines to use cloud services could go a long way in addressing this issue. There are instances of airlines using cloud technology. For example, Hongkong Airlines shifted from its traditional IT system to Cloud Computing and is using Huawei's FusionCloud desktop cloud solution. This solution has a cloud-based data centre also called desktop-cloud virtualization platform, and it has about 500 Virtual Machines, and is efficiently managing the airlines. In addition to this, the Jet Aviation has choose cloud services from T-systems and uses a cloud computing variant 'Dynamic services for SAP solutions. Using this, Jet Aviation keeps track of a wide range of its services from engineering to sale of its aircraft. (Vagdevi& Guru Prasas, 2015)

4.6.3.2 Prospects to Host Cloud Servers:

Given the importance of bringing down the operating costs in running the cloud servers, the trend of adoption of geographically distributed DCs is increasing and it is pertinent to bring down the costs of operations and consumption of energy. Currently, companies like Google, Amazon and Microsoft are the major players in the field of cloud services and they are resorting to deployment of distributed DCs, in order to meet the growing demand for low latency cloud services. It is in this process these companies would be moving their workload to locations, where the energy is less costly and where the cooling costs of the cloud servers are low.

Given this backdrop, Uttarakhand has wide opportunities of business of hosting the cloud servers, due to the advantage of State's cool climatic conditions. The cloud servers require the maintenance of temperature at optimal levels, in order to perform better. The State's climatic condition, by and large would be congenial to maintain this optimal temperature and thus improve the server's efficiency and also reduce the operational costs. In fact, the cooling costs in the State could be significantly lesser, when compared

to many other locations in the country. Thus, possibilities may be explored to invite multinationals to establish their cloud servers in the State. As a logical corollary of this whole exercise, the eventual beneficiaries would be the passengers and the State Government, where the passengers get better services at lower costs and the Government could generate revenues from hosting the servers. Given the host of prospects, The State may also consider policy initiatives towards hosting of cloud serves in the State.

4.6.3.3 The Challenge and a Solution:

While the cloud servers could be a big leap in achieving operational efficiency, there is bigger challenge in the way. The huge success of the concept of cloud computing services has led to complexity inmanagement of big computing infrastructures and high operating costs. When it comes to infrastructure, cloud-computing demands the establishment of Data Centres, which consumes considerably amount of energy. Financially it takes a toll on the users of cloud serves, as the Data Centres consume nearly 30 percent to 50 percent of their operational costs on power alone.

In order to overcome this challenge, various studies have been conducted and the literature suggests that renewable energy usage in this context is the best available option. In fact there is a proven record that, coupled with smart load allocation strategies, usage of renewable energy could bring down the operating costs of the Data Centres. Studies like (Lagana, D.et.al, 2018) suggests that moving applications and services to data centres that are equipped with Renewable Energy Sources (RES) could lead to several benefits both for the data centre provider, which can reduce the costs of acquiring grid energy, and for the society in general, due to more intense exploitation of green energy and the reduction of carbon emissions. Thus, usage of renewable energy to support the cloud computing mechanism and its adaption by the airlines operating in the state, would in effect, has the potential to change the high cost structure if the Regional Connectivity Scheme and makes it more viable.

On the other hand there are also challenges like adverse climate conditions like heavy rainfall or snowfall which will create issues in adjusting the temperature of the server thus increasing the cost of maintenance. Secondly, natural hazards like landslides, cloudbursts, and flood etc. will hamper the reliability of Internet and electricity/energy. Thirdly, these data centres need high-speedInternet connectivity and there are still areas in the State, which do not have Internet connectivity. Addressing these issues requires building up of necessary infrastructure to tackle such challenges. It would not help to make the cloud servers functional but also bringInternet to the remote areas of the State.

4.6.3.4 Conclusion:

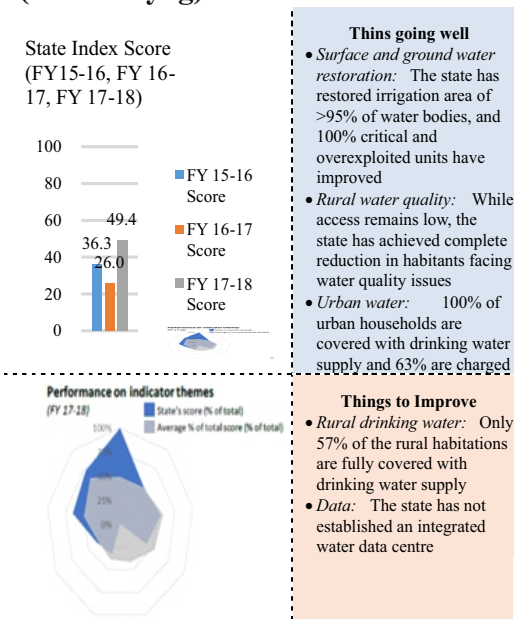
Uttarakhand has bright prospects on the front of civil aviation, given its terrain and the demand for airline services, thanks to a booming tourism industry. Being the biggest beneficiary in the country in the second round of UDAN, there is a need to address the challenges associated with civil aviation like viability, operational efficiency, skills, subsidies, infrastructure, and safety. Adapting to new technologies and replicating the suitable best practices from different states of India and from other nations would help to overcome these challenges to certain extent. For more sustainable solutions, proactive policies aimed at addressing these challenges in a time bound manner is needed. It would go a long way in realizing the credo of 'Hawaii chappal se hawai jahaz tak' in the time to come.

CHAPTER 5
Water Resources & Security

Water Resources of Uttarakhand are important for the water security of not just the State but also for more than half of the population of the country residing in the indo-gangetic plains of northern and eastern India. Uttarakhand endowed with more than adequate water resources being home to *Gangotri* and *Yamnotri*, the origins of the Rivers Ganga and Yamuna respectively. However, we must take stock of the situation as per water security beyond the conventional understanding of water resources.

Water security is often defined as "the reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks" (Grey and Sadoff, 2007). If we take a narrow standpoint of Uttarakhand, then the assessment of water security appears to be simpler than if we consider Uttarakhand as an important source of water security to most of Northern India as well. However, the overarching focus on availability of water resources and the development of irrigation potential makes it difficult to collate data and make an objective assessment of the water security for the State.

Fig 5.1: CMWI 2.0 and Uttarakhand (NIti Aaayog)

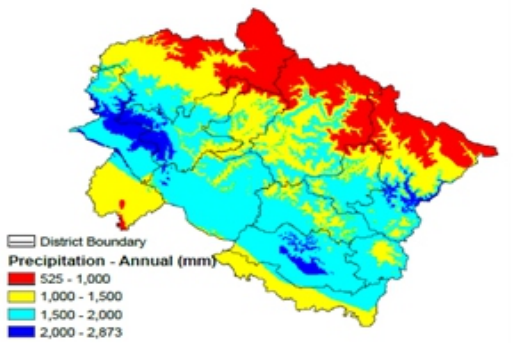


Water security is a critical area of concern for Uttarakhand as it has a score of only 49. Which

Narrowly puts it in the low performing States with scores of less than 50. Only four States in all and one in North-Eastern and Himalayan States have scores above 65 which makes them high performing states. Uttarakhand is currently ranked second among the latter category next to only Himachal Pradesh, which has a score of 67. Uttarakhand has seen rapid fluctuations in ranking in this category from 4 to 6 to 2 in FY15-16, FY16-17 and FY17-18 respectively as per the 2nd Report of Composite Water Management Index, published by the NITI Aayog. The scores have fluctuated from 36.3 to 26 to 49.4 over these years. The summary of the State's performance is given in the adjoining figure reproduced from the said report. This sets the tone for this chapter and its importance to the State in general and its economics in particular.

5.1 Thematic Understanding of Water Resources of the State

Fig 5.2: Precipitation – Annual



Source: Appl Water Sci (2017) -https://doi.org/10.1007/s13201-017-0586-5

The availability of water in the State needs to start with the precipitation available in the State as given in the figure below. We clearly see that there are very few areas in the State that do not receive sufficient rainfall. In fact it is to be noted that these are the areas that abound with glaciers in the higher reaches of

the Himalayas and the lack of precipitation here is easily (and more than) made up by the availability of glaciers.

The State is therefore blessed by a combination of glacial and precipitation based water flows sufficient to uphold the life and livelihoods of most of northern India.

Uttarakhand lies on the south slope of Himalaya ranges and the climate varies from sub-tropical forests at lower elevation to glaciers at higher elevation. The hilly parts of Uttarakhand experience cold climate and high rainfall. Significantly a large part of the State remains under snow cover throughout the year. The long run average (1901-2002) annual rainfall of the State, as recorded is 1,547 mm. the maximum average rainfall in the State is recorded for Champawat district at 2426.77 mm and the lowest average rainfall in the State is recorded for Hardwar District at 406.70 mm. the standard deviation of the rainfall varies from 179.36 mm to 296.32 mm across districts in the State. (Kumar et. al., 2017).

Table 5.1: Summary of Statistics for Annual Rainfall (1901-2002)

District	Minimum (mm)	Maximum (mm)	Mean (mm)	Standard Deviation (mm)
Almora	575.80	2199.30	1132.43	268.76
Bageshwar	626.38	2325.89	1220.74	276.96
Chamoli	615.78	2082.46	1131.34	245.64
Champawat	554.73	2426.77	1240.55	296.32
Dehradun	460.91	1545.15	894.15	193.48
Haridwar	406.70	1374.72	821.12	179.36
Nainital	533.40	2073.77	1071.94	258.55
Pauri Garhwal	481.10	1837.18	995.01	224.82
Pithoragarh	631.99	2306.05	1244.52	264.86
Rudraprayag	579.61	2044.70	1110.44	241.01
Tehri Garhwal	512.52	1859.77	1021.70	221.75
US Nagar	509.52	1881.72	1004.73	233.76
Uttarkashi	557.08	1810.58	1009.83	216.82

Source: from Kumat et. al

Uttarakhand is a large beneficiary of the Indian Himalayan glacial system. The number of glaciers in the Himalayan region are estimated to be around 12,000 (Kaul, 1999; ICIMOD, 2001) and the area under glaciers has been estimated to be 33,000 km^2 (Kaul, 1999; Rai and Gurung, 2005). The Indian Himalayan Glacier System with 9575 glaciers (Singh 2009), is the third largest glacier system on earth and holds the largest reserves of freshwater in the form of snow and ice outside the polar regions (GSI, 2001). The maximum concentration of glaciers is in NW Himalaya. The length of glaciers varies from 1-72 km and these extend between altitudes ranging from 3700 to 6000 m (GSI 2001). On an average, water received in form of rainfall amounts to 94.62 BCM, of which 17% is evaporated, 29.5% is absorbed by soil, and 15.4% infiltrates and recharges ground water while 37.5% contributes to the river systems.

There are 1,439 glaciers in Uttarakhand Himalaya covering a total area of 4,060 km^2. These glaciers have been further sub-divided in the following mountain ranges: Nanda Devi, Dauliganga, Kamet, Gangotri, Satopanth and Bandarpunch Groups. The glacier inventory for Uttarakhand Himalaya using remote sensing techniques was prepared by Wadia Institute of Himalayan Geology and ICIMOD.

Table 5.1: Glaciers of Uttarakhand (2005) (UAPCCm 2014)

S.No.	Basin	No. of Glacier	Area (Km^2)	Volume (Km^3)
1.	Tonus	102	162.58	17.43
2.	Yamuna	22	10.4	0.45
3.	Bhagirathi	374	921.46	129.93
4.	Bhilangana	19	112.84	13.48
5.	Mandakini	40	81.64	5.98
6.	Alaknanda	457	1434.56	170.37
7.	Pindari	43	158.99	15.01
8.	Ramganga	7	6.74	0.322
9.	Goriganga	128	561.35	69.18
10.	Dhauliganga	135	373.19	34.6
11.	Kutiyanghi	112	236.24	18.64
	Total	**1439**	**4060.04**	**475.43**

Fig 5.3: River Basin Map of Uttarakhand Showing Rivers, Tributeries & Water Bodies

River systems originating from Uttarakhand are fed by melting of snow and ice stored in the glaciers' spring discharge and this helps the rivers maintain a healthy level of stream flow all-round the year. Snow, glacier melt and springs together with monsoonal precipitation determines the headwater flow regimes of large parts of Uttarakhand, including central and eastern Himalayan tributaries of River Ganga. In areas dominated by winter snowfall, peak glacier runoff contributes to the otherwise low flow conditions, governed by lower precipitation in summer; in areas dominated by the summer monsoon (Uttarakhand Himalaya), peak glacier runoff contributes to the peak river flow in July and August months. The runoff contribution from glacier imbalance is relatively minor in the wetter monsoonal catchments of the Ganges.

The drainage systems of Uttarakhand have been categorised into 6 catchments, viz. the Yamuna Catchment, Bhagirathi Catchment, Alaknanda Catchment, Mandakini Catchment, Pindar Catchment and Kali Catchment and further divided into 26 watersheds, which are divided into 110 SWS and finally into 1,110 MWS. In Uttarakhand there are 31 natural lakes of varying sizes, the total area of which is around 300 hectares (UPACC 2014). The glacial drainage benefits the Garhwal region more. The benefit from glacial system is limited in Kumaon region.

Table 5.2: Runoff Including Glacial Melts Within State Boundary (in MCM)

Basin/ Sub-basin (Area in Km^2)	Discharge (in MCM) in Water Year at the Outlet
Upper Yamuna (5783)	Data Not available
Ganga (25422)	36925
Ramganga (11434)	Data Not available
Sharda (11007)	4090
Total	41015 MCM + more

(Source: State Specific Action Plan for Water Sector Uttarakhand, GoU)

The above table clearly shows that the State is rich and very well endowed with precipitation and surface water resources and clearly has the potential of satisfying the needs of the whole nation if a technical solution existed. In the central and eastern Himalayas, lake growth has been observed in recent decades, with much larger absolute growth rates in the east, while in the drier northwest, total lake area decreased (Xinet al., 2008). The moraine walls that act as dams are structurally weak and unstable and undergo constant changes due to slope failures and slumping and there exists the danger of catastrophic failure, causing glacial lake outburst floods (GLOFs). These events are characterized by sudden release of huge amount of lake water that rushes along the stream channel downstream in the form of dangerous flood waves. Discharge rates of such floods are typically several thousand cubic meters per second. In Uttarakhand Himalayas there are approximately 118 glacial lakes of varying sizes, the total area of which is around 231 hectares.

Table 5.3: Altitude Range-Wise Distribution of High Altitude Lakes of Garhwal & Kumaon Himalayas

		(3k-4k m)		(4k-5k m)		(>5k)		TOTAL	
	District	No. lakes	Area in ha	No. lakes	Area in ha	No. lakes	Area in ha	No. lakes	Area in ha
1.	Chamoli	26	28	26	63	8	21	60	112
2.	Pithorgarh	3	3	20	65	2	8	25	76
3	Rudraprayag	1	2	-	-	-	-	1	2
4	Uttarkashi	10	10	22	31	-	-	32	41
	Total	40	43	68	159	10	29	118	231

(Source: UAPCC,2014)

Source: UAPCC, 2014

Springs: Relationship of humans with springs in Uttarakhand dates back as long as the civilization itself. Locally known, as 'Naula' or 'Dhara' almost 80% of hill population is dependent either directly or indirectly upon springs. Springs have been the lifeline for most of the hill settlements, supporting their ecosystem services & sustaining communities. They are the primary source to cater to the potable water for drinking, household activities and irrigation for the communities both rural and urban in Indian Himalayan region. Springs are the major groundwater sources in Hill districts. As per NITI Aayog report (2018) there are as many as 6504 villages in western Himalayas that are dependent upon springs for their water supply. In Uttarakhand only 594 villages out of a total of 16,793 have been reported to be dependent on springs for their water supply needs. UNDP has estimated that there are about 2,60,000 springs in the State, which provide 90% of the drinking water sources.

Many areas in the State are reportedly facing water shortages during times of the year. (Agarwal 2019). There are many issues reported about rising water shortages in the upper reaches of the State, which are home to origin of the rivers. This is largely ascribed to the high run off due to steep slopes. A 2018 NITI Aayog report claimed that more than 50% of mountain springs in the Himalayan region, including those in Uttarakhand, are drying up.

Figure 5.4: Springs of Uttarakhand (Source: Spring Atlas of Uttarakhand, CHIRAG.)

This is important, as most of the drinking water supply in the State is based on springs. The Spring map of the State given above clearly shows a disproportionate distribution of springs in the State leading to iniquitous availability of drinking water and the people have to rely on other sources as well. Most of the springs are situated in the Kumaon region as shown by the indigo colour on the figure on the left. The situation is alarming as per a CAG report, as springs are declining rapidly due to change in land use and loss of local

institutions that traditionally cared for them.

The State is endowed with sufficient ground water resources as well, as can be seen from the tables below. Tables 1A, 1B and 1 C give an indication of the existing situation of the State vis-a-vid groundwater availability. The availability of groundwater in Uttarakhand is higher than the current extraction rate and hence we can conclude that there is enough water security in a theoretical sense. However practically given the rocky terrain it may not be possible to harness ground water through most of the land in the State. As more groundwater is harnessed in a State abundant with surface water, various water resources and their interconnections need to be understood. There are in total 11 aquifer systems in the state. In Uttarakhand, an area of 41,000 km 2 has been identified for aquifer mapping in which 7700 Sq.km was targeted under 12th five year plan, while rest of the area was to be mapped under 13th five year plan. (Source: Department of Agriculture, Uttarakhand). The state is blessed with very good linkage between the groundwater and the surface water, thanks to the terrain despite the rocky strata. This translates into greater potential for utilizing and harnessing groundwater in a scientific manner than otherwise thought possible for hilly areas. The reliability that groundwater offers could be critical for industrialization of the State. A comprehensive policy focusing on the local requirements of the state and not so much linking with the national policy may be required to develop water resources and conserve them in a manner amenable to socio economic growth of the State.

Table 5.4: Status of Dynamic Groundwater Resources in Uttarakhand

Annual Replenishable Groundwater Resources	2.17 BCM
Net Annual Ground Water Availability	2.07 BCM
Annual Ground Water Draft	1.39 BCM
Stage of Ground Water Development	66%

BCM= Billion cubic meters Source: UAPCC 2014

5.2 A Description of Various Traditional Systems of Water Resources is Given Below.

Table 5.5: Traditional System Of Water Resources

Traditional System Of Water Resources	
GUL	• *Gul* In Kumaon, cultivation is on terraced fields, the problem of irrigating the fields was resolved by diverting water from nearby streams or rivers • They are the best example of water resource management in the hills and are usually dug along the contours of the slope. • *Guls* were used for drinking water and for running *gharats* or water mills.
NAULA	• *Naulas* are designed to collect water from subterranean springs. The flow of these springs is very sensitive and can be disturbed by seismic activity and human disturbance. • In Dwarahat, during survey it was found that several *naulas* like Khulkuda or Kholibhitar have dried up owing to the tremors of earthquake. • *Naulas* mostly found on the hill slopes in the lesser Himalayan region of Kumaon are covered reservoirs and exhibit masterpiece architectural features.
DHARAS	• It is a common source of drinking water and ca n be compared with a drinking water fountain. *Dharas* located both in mountain crests and in valleys are also popular in townships • In *dharas* also, the practice of planting trees was in vogue for symbolizing the sanctity of water. The water from a spring or a subterranean source is channelled through carved outlets. They are often in the shape of a pipe, through figures of animals like lions and cows also in vogue
SIMAR	• *Simar* are also known as *Gajar*. • *Gajar* is a marshy tract of land in an agricultural field and is created by the ground water. It is aptly suited for paddy cultivation. • Cultivation of high quality crops like basmati rice, medicin al plants and herbs are a common feature in *Gajars*. The medicinal plants normally grown in it are two varieties of *Brahmi*
CHUPTA ULA	• These are basically water holes for animals and are found mostly in high altitudes for use of graziers. • Are not permanent in nature and water is collected in them from springs or from

(Compilation)

Till 2012-13, 37,598 hand pumps had been installed in the State.(MSMEDI, GoUK) The yield of tube wells in the Shivalik formation, ranges from 50.4 m^3 /hr to 79.2 m^3 /hr; in Bhabhar formations the yield is up to 332.4 m^3 /hr. In the Tarai belt, the yield of tube wells ranges from 36 m3 / hr to 144 m^3 /hr and in the Indo Gangetic plain yield varies from 90 m3/hr to 198 m3/hr. However, there are number of unaccounted private pumps and tube wells used for drinking, commercial and irrigational purposes. Over the years there has been a drastic increase (82%) in the number of government drinking water tubewells and 59% increase in number of hand pumps. Extraction of water from deeper layers (up to 250m) of water is also prevalent as a result of advanced drilling techniques. The State has not yet enacted groundwater legislation for the systematic management of ground water resources.

The table below from a published report shows the institutional set up for governance of the water resources of the State.

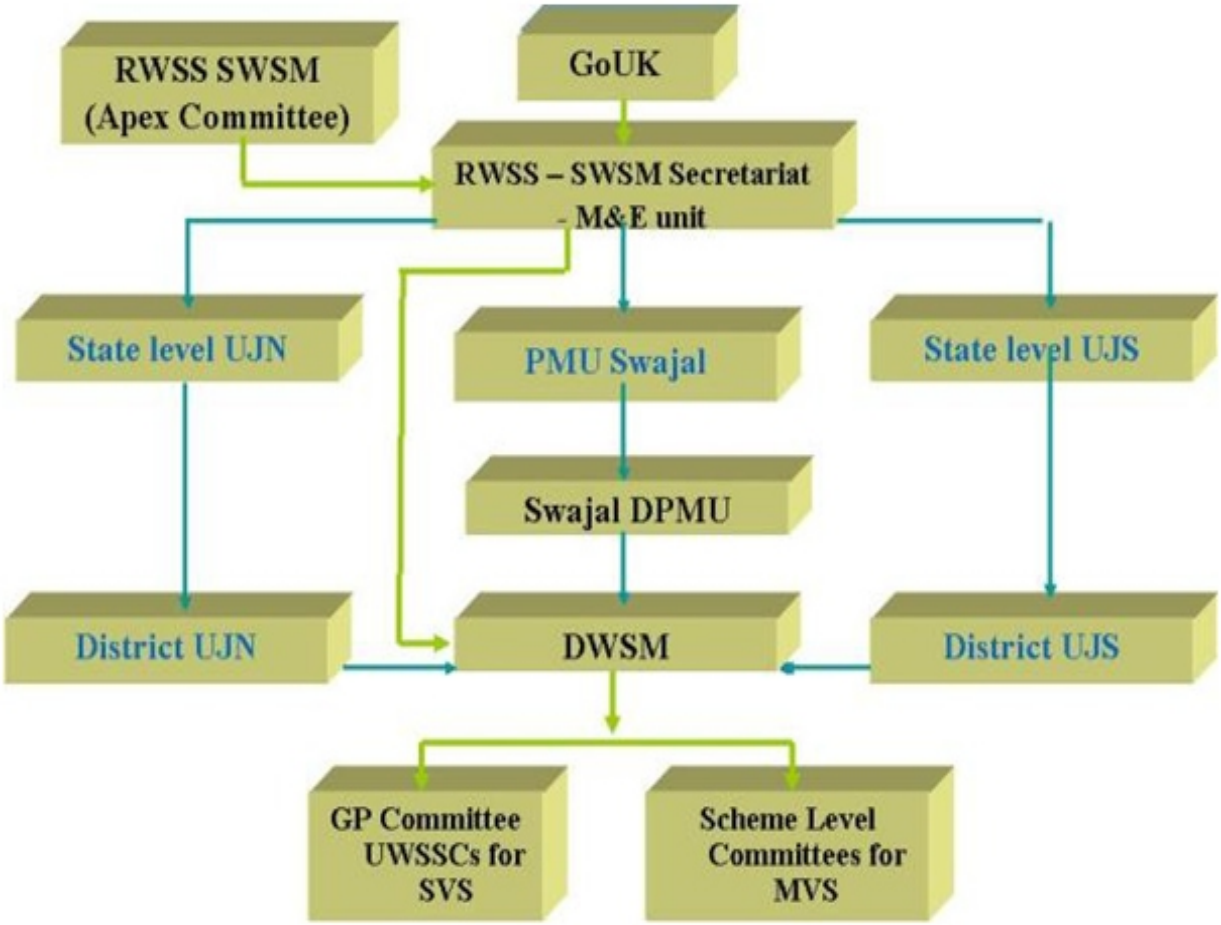
Table 5.6: Institutions of Water Governance in Uttarakhand – Indicative List

S.N.	Institution	Description of Function / Responsibility/ Mandate
1	State Water and sanitation Mission	Rural water supply, urban water supply and sewerage, and sanitation services
2	Uttarkahand Peyjal Nigam	Construction of schemes - drinking water and sewerage
3	Uttarkahand Jal Sansthan	O&M of such constructed schemes by UJN
4	PMU-Swajal unit	Implements World Bank assisted URWSSP, GoI funded NBA NRDWP projects
5	Uttarakhand Irrigation Department	Construction and Maintenance of Civil Works of Hydropower Projects
6	State Pollution Control Board	Monitors quality of water in the State especially w.r.t. industries
7	Panchayati Raj Institutions	Responsible for administering line and local projects related to water
8	Municipal corporation &municipalities etc.	Line activities related to water supply and sanitation

(Compilation)

5.3 Organizational Structure of the State Water and Sanitation Mission

Figure 5.5: The Organizational structure of water management agencies



(GoUK as published on the website)

5.4 Role & Responsibilities of Various Government Departments for the Development of Water Resources

There are various government departments, which share the responsibility of the development of the water resources in the State. In the case of irrigation, Uttarakhand has a very different system compared to larger parts of India, as the responsibility for development of the water resources are shared between many departments across locations. This induces a huge coordination effort and costs towards the outcomes. Given the diverse nature of lands and climatic conditions in the State, including altitudes and soil conditions and seasonality, it may still be prudent to have such a structure but a concerted review of the same may be undertaken to figure out efficiency and effectiveness gaps that may be filled up.

At the national level the Central Water Commission looks after Surface Water and river networks in Uttarakhand State. CWC monitors various hydrological parameters like Gauge, Discharge, Silt and Water Quality at different reaches at surface water. Various reservoirs and Dams are under control of Uttarakhand Jal Vidyut Nigam (UJVNL). There are certain private/ semi- government departments like THDC, which is operating Tehri Dam. Barrages and canals are operated by Irrigation Department, Uttarakhand for irrigation purpose in the State. Also Minor Irrigation Department is looking after minor irrigation schemes. A few structures viz. Bhimgoda Barrage, Haridwar & Ramganga Dam, Kalagarh are under control of UP Irrigation Department, which diverts water from Uttarakhand to UP State for irrigation and other purposes. Uttarakhand Jal Sansthan and

Pey Jal Nigam provide drinking water supply to various households and industries through ground and surface water.

A very important role is played by the Central Ground Water Board (CGWB) a central government, which advises on policy and action matter on almost everything related to groundwater in the country. It is also associated with the Central Ground Water Authority (CGWA). The authority is responsible for notifying area for regulation vis a vis groundwater extraction use and management. It has so far had a very little role in the affairs of the State despite having a strong presence in the State but it could be a very important institution for the State in aiding the policies and actions ahead keeping in mind the challenges of rapid urbanization, industrialization and massive climate change expected in the State and its adjoining areas too. The ministry of water resources is also a very important player, which is going to have increased focus and power across the country in the future. The ministry ought to and can be expected to pay very special attention to the State of Uttarakhand given the connections of surface and groundwater of the State with the water security of not only the State but the whole of northern Gangetic plains which house more than 50% of the nation's population and more than 5% of the global population.

The remaining water resources are under local bodies and they are often starved for funds or unable to take up decisions at the basin level, lacking institutions that govern the entire basin. Most water management institutions are set up for political boundaries and not for hydrogeological boundaries and as such **there is a strong need to shift to integrated water management and structure the management of water resources and delivery along a IWM approach with basin management as the founding base of the same**.

An indicative list of the current projects, schemes and financing underway for water resources management is provided here:

- FPARP-I & FPARP-II (Farmer participatory Action Research Programme)
- DRIP (Dam Rehabilitation & Implementation Project)
- AIBP (Accelerated Irrigation Benefit Programme)
- PMKSY
- Ganga Rejuvenation
- Interlinking of River
- CADWM
- Flood Management Programme
- R&D Programme in water sector
- Dam Rehabilitation & Implementation Programme

5.5 The Composite Water Management Index and Performance of Uttarakhand

The CMWI was formulated by the Niti Aayog in 2018 in context of the water crisis and comprises 28 indicators cross 9 broad sectors. The nation was divided in two types of States to provide special attention to issues of North Eastern and Himalayan region States. The Aayog and the State governments collect the data for the same, which is then verified by an independent agency. It highlighted growing national crisis of groundwater management. It also allows us to compare the performance vis a vis other States and previous years for the State. It also stresses the need for data driven decision making with regards to policies that impact water and economics.

The index comprises of nine broad sectors namely, source augmentation and restoration of water bodies, source augmentation (groundwater), major and medium irrigation, watershed development, participatory irrigation practices, sustainable on-farm water use practices, rural drinking water, urban water supply and sanitation, policy and governance. These are mapped by 62 indicators.

Overall the States are showing progress but they are far from what is required to take care of the challenge of water that the country and

The entire section is based on a quick analysis of the second report on composite water management index published by NITI Aayog in 2019.

the State is faced with. While Uttarakhand recorded one of the steepest fall in rankings in the first report compared to the previous year, it has shown considerable improvement in the last year. While the average improvement across States in scores was 5.9, the improvement for Uttarakhand was 23.4, which is one of the highest in the nation.

The areas of concern for the State are related to food security as the wheat-paddy cropping system practised in large parts of the grain growing areas of the State account for a large part of the demand for agriculture and also for the State as a whole. These are vulnerable to severe water scarcity if not managed properly. Both these crops especially the basmati rice exports are problematic with respect to virtual water exports to the tune of 37 lakh tonnes across the country and 10 trillion litres of water in 2014-15. This is of special significance as Uttarakhand is one of the major producers of basmati rice. The report suggests that India should develop an *index of agricultural water export* and the same ought to be done for the State as well.

Urgent attention is required for urban demand hubs. Also Uttarakhand must plan better for the industrial demand of water, which is expected to rise three folds for the country and much more for the State, if rapid industrialization is targeted. Since the State is a major producer of hydropower for the nation, it is imperative that the State assesses water availability linked to power production every year, especially for inter-sectoral allocation of water resources. The report also specifically mentions the Himalayan region for risk of biodiversity destruction due to water security challenges. Uttarakhand will need to do a lot in this regard. It highlights areas that need immediate action for groundwater recharge infrastructure in regions wherever possible. Also more data on the indicators is required and needs to be shared with independent and other agencies. This would also add to better governance in the sector in the State. Uttarakhand has been a low performer in these regards. While clearly surface water would seem to be more important in the State but actually agriculture and round the year needs can be serviced only with the help of groundwater. The State needs to develop new technologies to make this possible even in hilly areas of the State. However, the State has performed above median on this indicator.

The State has performed just below the median on supply side management of major and medium irrigation. It has almost constant performance on irrigation potential used as a percentage of irrigation potential created and this is one indicator on which progress is possible by setting up local institutions which are a cultural strength of the State. The State has however lagged at identifying new projects in these regards. The number of projects identified has gone down, as has the expenditure on such projects. The proportion of lined canal network to total length of canals is just below the median and there is scope for improvement considering the expectation of extreme weather events to increase in this zone.

Uttarakhand has performed better than most States but below the median on the indicator of watershed management. Having undulating topography, watershed management is essential. Given the culture of collectives in the State, participatory approaches to watershed development should be preferred to facilitate regular maintenance as well as long sustained use of the infrastructure. The area under rainfed irrigation is lesser than the national median. The dependence on rain for agriculture is very high in the hilly tracts of the State and traditional forms of irrigation infrastructure can be explored to improve the situation and reduce the variability of agriculture. Farm level water harvesting structures can be very useful given the small size of farms in these areas. Large infrastructure is not required for most parts of the State. The State seriously lagging in terms of geo tagging of whatever infrastructure has been created, and this accounts for poorer data and water governance in the State. One of the important areas identified for action across the country and especially for the State is use of participatory irrigation management for

management of local level irrigation infrastructure and delivery. In fact, the State has almost nil achievement on this front and there is a lot of scope for improvement here. This will not only benefit irrigation but would have spill over benefits to drinking and other local cottage industry demands for water as well. The State needs to urgently set up the framework for rolling this out and establish WUAs to take up the activities at the local level to make this a reality. Due to these lacunae the State and most States in its category have performed very poorly on the associated indictors brining their score down.

There are many areas where Uttarakhand has performed well. Some of these are source augmentation and restoration of water bodies. Uttarakhand has outperformed all States on the area irrigated by restored water bodies compared to total irrigation potential of all identified bodies by achieving 97% irrigation potential. This could practically mean that there is very little scope for improvement on this indicator possible ahead. Further improvement is possible by taking closer look at traditional water structures and resources in the State and working on them. The State has also recorded an improvement of water table of all critical or overexploited water resources of the State. This may be due to rainfall and it should be understood that a lot can achieved by better management alone and cannot be left to the vagaries of monsoon and rainfall.

The State is also left wanting in its performance in terms of adoption of micro-irrigation but has done well in terms of metering and energising the tube wells in the State. There is much left to do in terms of rural drinking water supply as there is hardly any rural habitation with 24X7 piped supply of drinking water. However, this metric may not be useful for the State as traditional water structures as well as usage patterns do not warrant the need for 24X7 piped water supply if good quality natural water is made available the traditional way by reviving and maintaining the water sources. The State of Rajasthan could be used as an example as it has achieved significant progress in achieving Water security for the villages through effective implementation of the Mukhya Mantri Jal Swavlambhan Abhiyan (MJSA). This has not only achieved local water security for the villages, it has also scaled up to a large program the covers a vast proportion of the total rural population of the State.

Uttarakhand has also been able to put into place a regulatory framework for regulation of groundwater use /management. It has also been praised for its decentralized approach to water shed management. The same has been shown as useful for water conservation as well as protection against climate change. The water from check dams is lifted to overhead tanks using solar energy making it sustainable and useful for the local people with minimum maintenance and management. Such projects had been piloted across three districts at over 200 locations. Civil society organizations were partnered with to give training to farmers to construct farm ponds. These projects can hold up to 4,35,000 litres of water on farm or near farm. There are socioeconomic benefits of the project in terms of economic production as well as improvement in life quality. However, there is a vast scope for expanding the same as the State has performed poorly in terms of water harvesting structures constructed or rejuvenated. This is again where traditional water harvesting structures can play an important role for the State.

Uttarakhand has performed better than the median of its category States but lower than the national median on demand side management indicators. This signifies that much is left wanting in our approach and actions towards demand side management of water management in the State especially with respect to on-farm sustainable water use management. The State has not been able to establish separate agriculture feeders even in non-hilly areas and this brings the performance down for the State and also fails to throw up useful data. The State has performed well in terms of the urban water supply but there is scope for improvement and also there is an urgent need not reflected in the report as the expectation of rapid urbanization

holds for the State. At the expected rate of urbanization, the performance of the State could fall instead of improving if urgent steps are note taken up now.

The State needs to focus immediately on the sanitation needs of its urban habitations. It is already lagging most States in terms of management and treatment of wastewater but with the rapid urbanization as well as industrialization expected and targeted in the State respectively, this could be the biggest pain point for quality of life, pollution and water security for the State in a matter of couple of years. The time at hand for this is very little and the State faced an uphill task here.

5.6 Figuring out Specific Aspects of Demand Side of Water in Uttarakhand

There are multiple sectors that comprise the demand for water in the State of Uttarakhand. Given its different demographic, geographical and hydrogeological setting, the State has a different demand side profile compared to other States of India or hill regions of the world. Some of the sectors critical for the State are given here.

5.6.1 Forestry

Uttarakhand has a total geographical area of 53,483 km2 and the forest area in the State as recorded in 2018 was 24,303 km2 (VDF, MDF and OF), which is 45.44% of the total geographical area (India State of Forest Report, 2019) The total forest area has decreased due to rotational felling and diversion of forest lands for development activities. (Uniyal et al 2007). The forests of the State are of critical global importance for the supply of some rare herbs and also other herbal and aromatic products in bulk supply. Water security to the forests is therefore critical as global supply chains are dependent on the same, apart from the livelihoods of a large chunk of population including indigenous people of the State. The flow of River Ganges is important for river rafting and other water sports at Rishikesh, a global tourist attraction. There are many more forest sites like Corbett national park and its adjoining areas, which can be developed into attractive tourist destinations and as such the assured and regular supply of good quality of water is an imperative for the development of forest areas of the State.

5.6.2 Farm Sector Including Agriculture

It is an essential given that agriculture takes up most of the space when we discuss water demand in any geography. In a country like India various estimates put the consumption of water by agriculture / agribusiness sector to anywhere in between 75% -90%. Thus it is the most important water consumption sector. The fact that it produces the food for survival of the human race and is a primary source.of earning for most of the population makes it even more important for the economy.

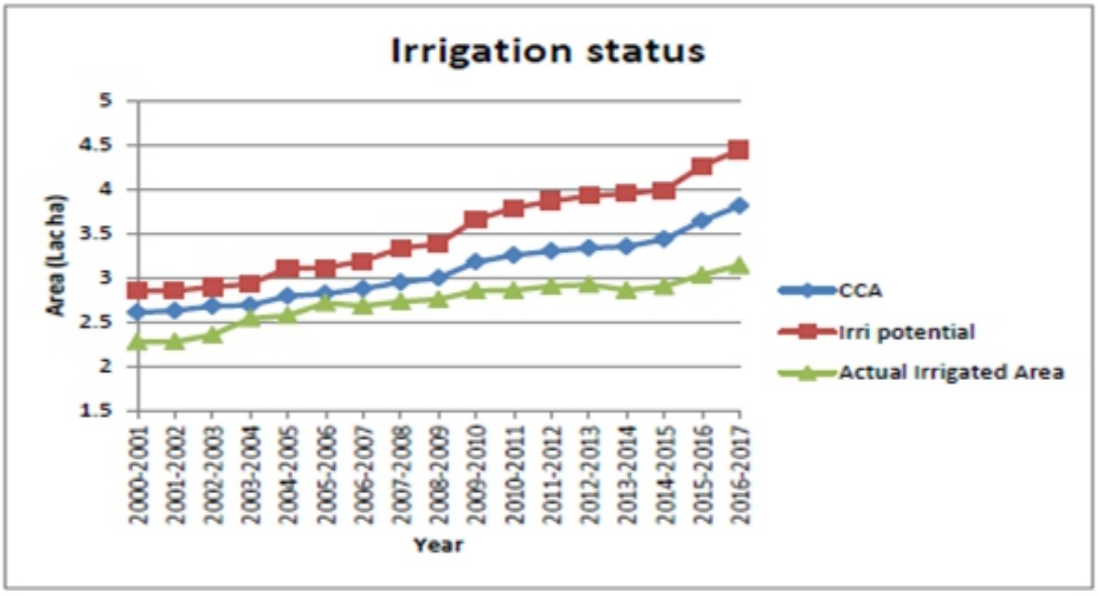
Figure 5.6: Principal Aquifer Systems of Uttarakhand

Source: Draft SSAP report, 2016

5.6.3 Rainfed and Irrigated Agriculture

As per 2015-16 agriculture statistics, Gross cultivable area is 1547219 ha. By 2016-17, the actual irrigated area in the State was 3.142 lakh ha and Cultural Command Area was 3.815 lakh ha. Despite this, rain-fed agriculture abounds in the State and irrigation is usually confined to the plains. The cropping intensity in the State is 155.02%, which is way above the national average. The figure gives the spread of irrigation and the potential irrigated area in the State between 2000-2017

Figure 5.7: Irrigated area over 2000-2017 in Uttarakhand

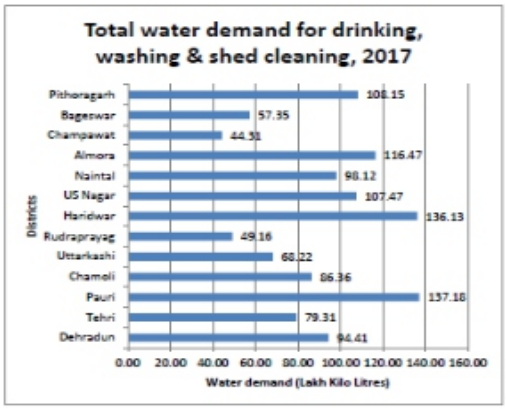


The State also battles low water utilization of water infrastructure due to the distinctive topography as well as demography of the State. The water use efficiencies across projects are generally low in Uttarakhand. The water use efficiency is 65-70% for groundwater projects whereas only 35-40% for surface water projects in the State.

5.6.4 Livestock, Birds and others (Animal Husbandry)

As the 19th livestock census carried out in the year 2012 indicates, Uttarakhand has 0.95% of the total cattle, 0.78% of the total buffaloes, 0.38% of the sheep, 0.92% of the goats, 0.19% of pigs and 0.58% of poultry available in the country (20th Livestock Census, 2019). Livestock production in Uttarakhand is mainly pursued by farmers with small land holdings (marginal, small and landless), making the provision of water supply, necessary. The sub-sector imposes a huge demand on the water sector directly as well as indirectly for stuff consumed by the animals. The figure gives the demand from the e Livestock sector of the State for 2017. The annual demand of water for the livestock sector in that particular year was 1182.64 lakh KL of water. This has reduced due to reduction in population of livestock in the recent past in the State. However, if dairy and poultry farming increase in popularity over the years then this requirement can be expected to grow in the coming times.

Figure 8: Water Requirement of Livestock Sector



Source: Draft SSAP report, 2016

5.6.5 Fisheries and Aquaculture

There is a vast potential of fisheries development in Uttarakhand. The rivers in Uttarakhand with a total length of 2700 km are the major resources for fisheries development. There are several natural lakes at various altitudes that might provide an excellent source for fish production. There are around 78 fish species that have been found in Uttarakhand. About 4578.30 metric tons of fish production takes place in the State. The fish productivity has been recorded at 50 kg/ha at U.S. Nagar. Fish Production is highly dependent on the quality of water, being the nutrition source as well as habitat for the fishes.

5.6.7 Industry and Infrastructure

The cumulative demand for water by the industrial sector in the State is clubbed with domestic demand and was expected to amount to only 0.03 BCM/ yr in 2011. This was expected to increase manifold to 0.90 BCM/ yr by 2025. Thus it is clearly still way below its potential development and from a water perspective the State can think of water-based businesses that also lead to employment generation. Industry maybe assuming that water in Uttarakhand is always of good quality but the baseline is that industrial requirement is also quality conscious and hence usually clubbed with domestic demand for accounting purpose. From a water security perspective, the State has to be conscious of water quality and consider the development of water quality maps for the State. (Dobhal et .al.)

5.6.8 Drinking Water and Domestic Use

Out of total 39142 habitations in the State, 38159 are covered with piped water supply. In the State, drinking water is being supplied and managed mainly by the department of drinking water. The department is mainly concerned with Uttarakhand Jal Sansthan (UJS), Peyjal Vikas Evam Nirman Nigam (UPJN) and Swajal Project. Currently, 13 Project Management Units of Swajal Project are working in State i.e. one in each district. According to Directorate of Economics and Statistics Dehradun, 31915 and 8459 hand pumps were installed up to 2013-2014 by UPJN and UJS, respectively in the State.

The government of Uttarakhand has been very active for providing drinking water to its citizens but it is literally an uphill task. A news report of 2017 shows it starkly in the following table:

Table 5.7: Situation of Villages vis-à-vis drinking water (% of demand supplied)

District	00.25	25-50	50-75	75-100	Total
Almora	91	536	656	570	1853
Utttarkashi	01	214	194	214	633
US Nagar	00	00	07	57	64
Pauri	827	448	974	1078	3327
Champawat	04	96	260	274	634
Chamoli	288	111	830	410	1639
Tehri	575	2243	1297	669	4784
Dehradun	01	17	529	1082	1629
Nainital	00	20	100	256	376
Pithoragarh	85	162	305	608	1160
Bageshwar	98	176	197	61	532
Rudraprayag	00	35	185	682	902
Hardwar	04	24	52	233	313
Total Column	**1974**	**4082**	**5586**	**6194**	**17836**
	(11.06%)	**(22.89%)**	**(31.32%)**	**(34.73%)**	

(Source: SWSM, GoUK)

The table above clearly shows that more than 64% villages are covered with less than 75% access to drinking water via a reliable infrastructure such as a piped water supply. This clearly means that the focus has to shift to rural drinking water supply using local water resources in the near future. This would also entail that the table below is even more interesting as it clearly shows that the supply of water is deficient compared to the demand in 10 out of 13 districts in Uttarakhand. This also shows that there is an urgent need to launch new schemes and develop the infrastructure required to provide the lagging drinking water facilities to the urban residents and inhabitations.

Table 5.8: Status of Urban Areas with respect to drinking water supply

City	Population	Demand	Supply
Almora	138000	18.63	8.77
Utttarkashi	86226	11.65	9.92
US Nagar	586397	71.98	51.96
Pauri	248300	32.81	28.17
Champawat	64000	8.64	3.68
Chamoli	110017	14.85	7.08
Tehri	142300	19.21	14.43
Dehradun	870337	117.5	108.26
Nainital	429265	57.95	79.89
Pithoragarh	125157	16.9	8.04
Bageshwar	15000	2.02	2.75
Rudraprayag	46848	6.32	1.58
Hardwar	315400	42.58	149.28

Source: SWSM, GoUK

The State government has been active in doing its bit in ramping up infrastructure but the sheer magnitude of the task seems to overpower it. Under the Swajal Project a total of 1700 check dams have been built in the State. a host of other associated water harvesting activities have also been taken up under the scheme to ensure the water security of the State. The PMKSY scheme also proposed 9196 check dams in the State. Once fully functional they could go a long way for the betterment of the State. However, many schemes of UJS are undergoing in the State to cater to the drinking water supply in different blocks of the State. Besides this, decrease in discharge of many schemes has occurred due to certain environmental conditions including climatic changes in certain areas.Uttarakhand has a long way to go before its ambitious targets for universal WSS coverage are met. The State, with an existing population of 11 million (2016), aims to achieve universal water supply coverage in urban areas by 2030, in rural areas by 2022, and (basic) sanitation coverage across the State by 2019. At the State level, 68 percent of households have piped water supply. About 78 percent of urban households and 64 percent of rural households have piped water supply. Of the total rural population of 7.2 million, 45 percent, i.e., 3.2 million people receive less than 40 litres of water per capita per day (lpcd). The duration of water supply varies between three to four hours in pumping schemes and six to eight hours in gravity schemes. The non-revenue water (NRW) supply is estimated to be about 40-50 percent. The State was declared open defecation-free (ODF) in June 2017. Several State and local level institutions have been tasked with improving services across the State (IBRD 2017, project appraisal document).

The Government of Uttarakhand's (GoUK) WSS programme comprises six components. As part of the Urban Water Supply component, the State envisages treated and pressurized piped water supply for all households by 2030, with at least 60 percent metered connections. While 64 percent of rural households have access to piped water supply, it is envisaged that universal coverage with 70 lpcd can be achieved by 2022 under the Rural Water Supply program. The Peri-urban Water Supply program specifically targets improvements from the existing 45 percent coverage and intermittent supply to the provision of universal water supply at par with urban standards.

5.7 Issues and Challenges

The Latest Composite Water Management Index (CWMI, 2018) by NITI Aayog, has ranked Uttarakhand as one of the lowest in performance index of water management, highlighting absence of water policy, lack of water data centre and deficit in rural water supply. This necessitates that all concerned take a closer look at the situation and assess the situation dispassionately. Most of the land area of the State is covered with mountains and hills with a very high slope. This makes it practically impossible to retain the water received as rainfall or ever from the melting of glaciers inside the State itself. This poses a serious risk to the water scarcity of the State both geographically as well as temporally. Very soon after monsoons the water starts

receding at an alarming rate leaving most of the residents toiling hard to fulfil their daily needs of water if not supported by infrastructure provisions from the State as well as private resources.

It must be noted that already 6 blocks in the State are semi-critical or critical with respect to use of Groundwater and this may be a an early warning for the times to come. The State has to prepare for this event despite its relatively low possibility. More important is to deal with temporary shortages across geographies and part of the year. Also as shown in the table 1c, the issue of water scarcity at a macro level also resolves around the quality of water and not quantity of water available in the State. The lower districts are affected in this regards and need to take extra precaution in ensuring the regular supply of quality potable and drinking water to the citizens and adequate good quality water for other demand sectors.

Clearly there is a long haul ahead for the State towards developing the basic infrastructure required to ensure water availability and access across all seasons to all its residents. There is an even more urgent need to start including, within planning, the need to have an outlook of water security as it would entail better coordination between various government departments and also between government and private efforts at maintain the water supply to meet demand for most productive use of water for drinking, industrial, natural resources management, entertainment and agricultural uses. The small table below gives a flavour of issues and challenges for ensuring water security from a climate change perspective and is indicative of the general issues and challenges for ensuring water security in the State of Uttarakhand.

Table 5.9: Issues and Challenges for Ensuring Water Security

GLACIERS	Ground Water	Urban	Rural
Recession of glacier High altitude lakes are prone to GLOF's	Over extraction of ground water	Only 1/3 of urban locations have near adequate water supply	App. 20% villages do not have water supply
Discrepancy to Glof's	Drying up of springs	Sources of water shifting from urban areas	Traditional sources i.e dharas and nallas drying up
Long term data missing hence reliable estimates cannot be made	Data on quantity and quality of springs is minimal	End of pipe solution such as lifting of water from distant sources	Road construction/ forest degradation leading to decline in spring discharge
	Depletion of recharge zones due to unscientific development	Lack of metering	Traditional knowledge has not received enough attention
	Lack of groundwater policy	In equitable distribution of water Lack of institutional arrangement	

Source: UAPCC

5.7.1 Recession of Glaciers in Uttarakhand:

Studies indicate that the rate of recession and volume change are irregular for glaciers across the Himalayan arc. This is attributed to the variations in micro-climate and physiography. In Uttarakhand some glaciers have been monitored for their mass balance and routinely for shifting of snout position of the glaciers. The Gangotri glacier is receding rapidly with the rate of retreat during the period 1962-1991 being about 20 m/yr. The

enhanced rate of retreat is attributed to the increased anthropogenic interventions.

The table ahead clearly shows that there are alarming rates of recession of many glaciers including important ones such as the Pindari, Gangotri, and Milan Glacier. This means that local or global warming is taking its toll on them and there is a need to create at least a local cooling effect to keep this recession in check if not accession again. This will be possible only with sound and sustained administrative, research and anthropogenic steps towards this outcome. This is more important as wherever available the data shows an increase in the rate of recession of the glaciers.

Table 5.10: Recession Trends Of Himalayan Glaciers

S.No	Name Of Glacier	Period Of Observation	Period (in years)	Recession (in m)	Average Rate (m/y)
1.	Milan Glacier	1848-1996	148	2472	16.70
2.	Pindari Glacier	1845-1966	121	2840	23.47
3.	Gangotri Glacier	1935-1996	61	1147	18.80
		1996-1999	3.5	76	22.24
4.	Tipra Bank Glacier	1960-1987	27	100	3.7
5.	Dokriani Glaccier	1962-1991	29	480	16.50
		1991-2000	09	164	18.2
6.	Chorabari	1992-1997	05	55	11
7.	Shanklup	1881-1957	76	518	06.82
8.	Poting	1906-1957	51	262	05.14
9.	Dunagiri	1992-1997	05	15	3.00
10.	Burphu	1966-1997	31	150	4.84

source: UAPCC

It is reported that half of the perennial springs have already dried up or have become seasonal resulting in acute water shortage for drinking and other domestic purposes across hundreds of Himalayan villages. In Uttarakhand alone, almost 12,000 springs have dried up. There are multiple drivers of Spring depletion i.e. changes in climate, land cover, land use and seismicity. Spring water emerges on to the surface naturally and therefore did not receive much attention. This is also evident in Uttarakhand Water Management and Regulation Act (UWMRA), 2013 as well, where springs have failed to mark their place distinctively. The regulation focuses specifically on 'water' as all surface and sub- surface water accruing from rivers, or any part of river, stream, and lake, natural collection of water in aquifers or natural drainage channel.

5.7.2 Urban Water:

Urban centres in the State i.e Mussoorie, Dehradun, Pauri, Almora, and Nainital are either suffering from acute water crises or management problems as detailed from data in an earlier table. Extreme precipitation and prolonged period of droughts have wide range of implications on urban water resources in Uttarakhand. The decline of springs and depletion of lakes in Uttarakhand have not only been affected by the processes of changing climate; a major drawback has been the rampant road construction facilitated by blasting of hillsides and deforestation, disturbing the water channels or the recharge zones through which springs and lakes maintain their flows and levels (NITI Aayog 2018). Urban towns in Uttarakhand have hugely suffered on this account. For example the historic city of Almora recorded 364 springs (Singh and Sharma 2014) at one point of time; a majority of them have dried up or become seasonal. Similarly, Nainital and Mussoorie major tourist destinations of Northern India are facing problems with sustainability of recharge zones and the increasing gap between demand and supply respectively. Nainital Lake through which approximately 95% of water demand of the

town is met receives approximately 53% of the subsurface flow from a 2ha depression (valley fill) upstream of the town called Sukhatal (Dashet al 2008). Over the last 10 years, rampant illegal construction and dumping of debris took place over the valley fill, obstructing the function of the lake through which Nainital Lake received a significant amount of subsurface water throughout the year, resulting in constant decline of the lake. A recent survey conducted by the State irrigation department revealed that the water body's depth has shrunk to 17.25 metres due to siltation. However, the current winter rains have reported a higher water level than in a decade during winters. This could mean that small and simple steps are possible alternatives to delivering big outcomes.

5.7.3 Major Water Supply Challenges of the Rapidly Growing Peri-Urban Areas of Uttarakhand:

- **Absence of a formal water supply programme for peri-urban areas:** There is no formal water supply program for the peri-urban areas, as these areas stretch five to ten kms outside the municipal limits, currently under the Gram Panchayat but having characteristics of Nagar Panchayat.
- **Demand for urban water supply services:** These areas are typically characterized by expanding housing colonies, institutions, and commercial activities in the vicinity of large towns, with growing demand for WSS services similar to the surrounding urban areas.
- **Non-committed funding:** While the State receives funding for urban areas (GoI programs including recent Jn NURM, and now AMRUT) and Rural areas (NRDWP, SBM), there is no dedicated funding for the rapidly growing peri-urban areas.
- **Lack of Regional Planning:** There is currently no WSS master-plan or any other WSS planning tool which covers the peri-urban areas.
- **Other challenges:** Heavy influx of tourists and pilgrims in most of these areas who depend mostly on private bore wells and septic tanks needs to be a priority to be addressed by the State.

Projects Irrigation/Multi Purpose

The practice of irrigation is an integral part of this communitarian agrarian culture. Unlike the hills, where agriculture is subsistence oriented, in the plains, it follows a market economy, and has given impetus to ancillary industries depending on agro products such as sugarcane mills, rice mills etc. The land holdings are far higher in the plains area. Farming is individualistic and market oriented. It is resource intensive in terms of use of water, modern agricultural technology, chemical fertilizers and pesticides and electric power. In the matter of irrigation, farmers are "consumers" of water provided by Government through the extensive canal systems and tube wells constructed by government for groups of farmers. There is also an abundance of individual wells.

5.8 Analysis of the Long-Term Trends

It can be easily and clearly shown that there is a need to act now given that merely a couple of years ago the level of development of Groundwater Development in terms of the groundwater draught as a proportion of the total available groundwater in the State was 51% and has jumped to 66% in the end months of 2019. Further the tables below show that Uttarakhand for the first time has over exploited blocks that were earlier classified as critical. Quality issues are also coming to the fore with three districts reporting contamination issues.

Table 5.11: Ground Water Development and Management (Source: CGWB state profile)

Over-exploited	2 blocks
Critical	NIL
Semi- critical	3 Blocks
Ground water user maps	5 districts

Table 5.12: Groundwater Quality Problems

Contaminants	Nitrate (>45 mg/l)
Districts affected (in part)	Dehradun, Hardwar, Udham Singh Nagar

Source: UAPCC 2014

One set of the major challenges of the state are expected to be if the climate change expectations come true to a significant level. Climate change is expected to alter the presence and use of most natural resources along various dimensions of existence. It is expected that over the medium term of climate change (long term for policy planning and policy making) there is going to be a massive change in rainfall patterns on one hand contemporary to the huge increase in glacial melting resulting in surging rivers. The former will impact the Kumaon region and the latter will impact the Garhwal region more. While the overall flow in rivers is expected to rise, there is evidence that it could be accompanied by more seasonal rainfall with increased peaks and variability. This is likely to be accompanied by and result in more extreme weather events such as floods, droughts, cloud bursts, storms and landslides. Surprisingly modelling results show that the impact could be most felt in the upper reaches of the state where taking immediate action is going to be difficult. Hence the urgent need to prepare for the likely outcomes. Apart from water the impact is going to be maximum on land use – especially land under forests and agriculture. Forests are going to change their characteristics and nature faced with rainfall changes and other changes. Faced with extreme weather events, while their environmental regulation function will become more valued they are expected to increasingly fail at being able to regulate fully the crises invoked by nature. The economics of forests would totally change due to change in the timber and NTFP production from them. The failure of the forests to take care of regulation function would impact the other land uses especially those downstream and inflict further climate change. These changes would change the cropping pattern and seasons of agriculture and hence the water demand across seasons and geography. These changes would in turn cause changes in consumption patterns, culture and institutions resulting in changes in management of natural resources.

The two type of changes will in turn would lead to more regional and economic changes in turn. The activities and demand for water will change across geography and sectors due to these changes. Thus in the long term the state will be looking at temporal, sectoral, spatial and seasonal changes in both water availability and demand posing a serious threat to the water security across the state. This is clearly laid out as per the Agenda for Climate Action Report for the state.

5.9 Preparedness for Water Security in Uttarakhand

The report titled Agenda for Climate Action published by the State Climate Change Centre, Uttarakhand Forest Department lays out many options and requirements for being prepared for water stress (read security) vis-à-vis climate change. These are important pointers for the State for water security in a long-term perspective.

For the agriculture sector, there is a need to re-evaluate the irrigation policies for the long-term climate change preparedness and also promote climate smart agri-technologies to pace the demand accordingly.

The state needs to work out policies that enable flexibility in agencies managing various facets of water resources, supply, demand and water security. The state also needs to develop strategies under these interconnected policies pertaining to conservation, water imports and managing recharge of aquifers. The state is blessed with huge diversity and adversity in terrain in a very small area making it difficult for the government to act in the speed intended. Thus it is imperative that the State moves aggressively towards more partnerships with the public along with increased decentralization. This would automatically incentivise local strategies and actions in dealing with the emerging and expected situations proactively and actively.

Decentralization will help to account for diversity whereas participation will help to tackle demand side issue as well. The partnerships will help to integrate the supply and demand side efforts for greater impact and better management.

Uttarakhand has always been known for collective and indigenous efforts for management of natural resources and it pays in the future to not only preserve but also to promote the same for increased adaptability to local conditions. There is also a big concern around the big dams in the state. The evidence coming from across the globe is increasingly pointing towards the fact that big dams and their reservoirs initiate or catalyse changes over the long term and therefore in the expectation of climate change and extreme weather events such as the kedarnath cloudburst, it is prudent to rethink the water storage and development practices for water and irrigation resources of the state. there is a growing body of knowledge directing at traditional water management practices and indigenous knowledge for frugal innovation and decentralization for increased adaptive capacity of the water management systems. However, the capacity building of the local and other institutions in this respect is the bottleneck and is not only time consuming but also demands a lot of resources that have to be made available. Community awareness and action can bring the costs of water management down considerably as espoused by the work of Nobel laureate Ms. Elinor Ostrom and also the success of water cooperatives in instances such as Ozar in Maharashtra point to this. As a summary for the water security there is an urgent need to reassess the situation with respect to supply –demand situation and predictions for the same at macro to micro scales and shift to a basin management approach. Also for better water management and alleviation of water security stress at local levels, it is advised to start a concerted shift to the Participatory Irrigation Management model from the Gram Panchayat level upwards. There is a prudent requirement to step up the promotion and adoption of water saving and re-use schemes. The principles of sustainability in terms of re-use and recycle hold for the water sector as well.

Special focus is needed for activities such as flood management and drought management on a larger scale and preparation of innovation banks for local use by individuals and households. More data based approach is required with inputs from indigenous knowledge especially using stream flow to figure out changes in demand across and within sectors. We need to prepare the users to move from a reactive to a proactive approach. The State needs to reassess the design of current water infrastructure taking into account the high variation and expected increase in variation over the long term to ensure there is enough water for different users across and within each of the water consuming sectors.

The origin of springs is usually in the forests of the State and the proper management of run off in the mountains and hills is dependent on the forests for checking soil erosion and smoothening the run off temporally. Thus working on improvement of forests towards better water management is an imperative for the State of Uttarakhand. There are many direct and indirect linkages between the forests and water management and they are important for ensuring water security in the State and for most of north India. This is also critical for management of water quality downstream keeping in view the possibility of soil erosion from steep slopes and hence has a direct impact on water security downstream. Similarly there is a need to roll out more comprehensive research for temperature change impact on glacial and snow melt as well as glacial lake outburst flows (GLOFs). We also need to understand better through proper action research, spring water dynamics in terms of quantity and quality of flows.

Way Forward:

To improve the water scenario of the State the following points come out from the discussion given above.

- **Integrated Water Resources Management (IWRM):** Rivers require a lot of focus to make more and more runoff available for use within Uttarakhand and it is suggested that water management across the State shift to Integrated Water Resources Management (IWRM) and the Basin approach to water management.
- **Water Security Management Based Planning:** There is an urgent and critical shift required from water availability based planning and implementation to water security management based planning and implementation. It is imperative that the concept of water security be understood and imbibed by each of the agencies involved.
- **Ground Water Legislation:** to be tightened and made more focused on demand side management in a proactive manner rather than a carrot and stick approach. Also the focus on legislation needs to be on enforceability and implementation thereby making technology advancements an imperative for good water management.
- **Increased Decentralization:** it is an imperative now and not just one among many options. The diversity of challenges and the adversity terrain deem it necessary to work with increasing speed of action and localization of solutions.
- **Partnerships and Stakeholder Coordination:** One of the most important requirements now and in the long term as well are, improving the coordination between various sources, sectors, stakeholders, and departments. This will make the whole system more efficient and effective towards realising the outcomes. Increased partnerships between various stakeholders especially the private and the public could be critical to speed up concerted action.
- **Managing Precipitation within the State:** There is an immediate need for consistent focus on managing precipitation in the State better. The State has to make comprehensive plans to utilize run-off better.It is best advised to use a combination or integration of modern and indigenous knowledge for the same.
- **Incorporating Traditional and Indigenous Knowledge:** Following the requirement to use traditional and indigenous knowledge, they must be accorded the necessary attention and resources to stop and reverse their neglect and integrate them with modern sources of water for planning and implementation purposes.
- **Community Awareness and Action:** there is an urgent need to work on and increase community awareness and action across the state to enable better demand management and increase the participation of community in resource management at the local level.
- **Strengthening of Institutions:** increased decentralization, partnerships, use of indigenous knowledge and community action all warrant for stronger and more mature institutions especially in a fragile environment and economic zone such as Uttarakhand. The state therefore needs to pay special attention to the strengthening of institutions across the state.
- **Reversing Glacial Recession:** There is critical need to understand glaciers and glacial melt far better that the current understanding. We need to quickly evolve action-research plans to develop implementable ideas and actions for reversing the glacial recession.
- **Scientific Need Assessment of Water Requirement: B**ased on data based population projections for drinking water, irrigation, entertainment & most importantly industrial demand, a sound assessment of water requirement, needs to be conducted.
- **Enhancing Data Collection Capacity and Capability:** Inadequate data on rainfall and temperature – number of meteorological stations to be increased or collect reliable data from private sources such as Skymet weather and other such sources.

- **Using the water lens for development of policies and incentives related to agriculture**
- **The state can think of developing a agricultural water export index to derive its water balance better.**
- **Development of block level and urban areawater management committees** involving experts and stakeholders and be spoke strategies for water conservation to be developed – based on topography and climatic conditions.
- **Incentivizing mechanisms for water conservation** at individual and community level.
- **Large scale citizen knowledge empowerment and engagement programs.** Creation of open access database.
- **Revival of Traditional Water Sources:** Special task forces to be formed to prepare action plans on revival of traditional water sources as well as their integration into water management plans for local areas as well as regions.
- **More flexibility:** increased number of organisations, institutions & agencies will need to deal with increased & complex changes across temporal, spatial, sectoral & seasonal dimensions and it is essential that they possess more flexibility in their business & operating models.
- **More comprehensive models of water management:** in order to prepare for the multipronged changes mentioned in the last point it is required that more comprehensive models for water and resources management be prepared to help the state plan ahead and be prepared for expected and unexpected events.

CHAPTER 6
Entrepreneurship Development in Uttarakhand

Abstract

To fulfil the aspirations of the residents of this beautiful landscape, Uttarakhand was carved out of Uttar Pradesh and became the 27th state of India on 9th November 2000. In this newly found state, natives of Uttarakhand have an opportunity to develop (social and economic) as per their ideals and aspirations. As a young state, the economic growth has been remarkable, and the state seems to be doing well on most of the social, economic and environmental indicators. But a close inspection of this growth story – especially 2015 onwards reveals the major challenges faced by this state. Unequal growth (hills vs plains), increasing income gap (hills vs plains and male vs female), risk of losing out on the demographic divident of young population, vulnerability to climate change and disasters (both natural and man-made), high costs of service delivery and rapidly changing global landscape (technology and competition) threatening the livelihoods of the natives are some of the major challenges before this young state. Though the state is taking the required steps to rise up to the challenge, its efforts need to be further supplemented by people. Globally, innovators and entrepreneurs are highly respected for their ability to turn losses into learning and eventually capitalize on problems by turning them into opportunities and hence the state also looks at its entrepreneurs to take the Uttarakhand story forward.

Entrepreneurial footprint in the growth story of Uttarakhand is limited. The top three districts with highest per capita annual income also have highest number of people working as employees. Common opinion within the state is that there is a lack of an entrepreneurial culture in Uttarakhand, which accounts for the slow development of potential growth drivers in the state. Though industrial clusters have developed but the development of ancillaries/ small and medium industries around big ones has not realized as per the expectations. But is this lack of entrepreneurial ability genuinely a cultural thing OR is this just a symptom of an under-developed entrepreneurial ecosystem? OR is because of a strategy which needs immediate revisions.

The present chapter provides a distilled summary of the current entrepreneurial ecosystem in the state and also suggests the way forward towards realizing the full entrepreneurial potential in Uttarakhand.

In addition to bringing prosperity and economic development in Uttarakhand, development of a vibrant entrepreneurial ecosystem will further support the long-term sustainable development of the state. Entrepreneurial activity will also be one of key drivers of economic recovery in the post lockdown scenario of the COVID 19 pandemic. As per the Himalayan State Regional Council (HSRC) at NITI Ayog, focussing on development of sustainable livelihoods (which includes entrepreneurship development and demand-based skill development) in the hill regions directly impacts 12 out of 17 SDGs (SDG -1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13 and 17). It will help to:

a) Mainstream the participation of the private sector in the overall development agenda of the state.

b) Mobilize technical and financial resources available outside the government system.

c) Develop a sense of responsibility and ownership among a larger base of taxpayers and will encourage them to perform their duties as citizens of this state.

d) Open unlimited possibilities of convergence, coordination, collaboration, networking and partnerships in the public – public and public – private space. This will in turn increase the efficiency and return on

investment of all development activities.

e) Transform Uttarakhand into a knowledge economy which in turn has better resilience against natural and markets threats.

The government of Uttarakhand has already been taking steps towards promotion and support of entrepreneurs in the state and several policies and programs are already being implemented in the state. The major policies and programs are as follows:

Name of the Policy / Program	Policy / Program Period	Nodal Department	Main Focus of the Policy / Program
MSME Policy	March 2015 - March 2020	District Industries Centre	Establishment and support of MSMEs in Uttarakhand.
Start-up Policy	Updated in February 2018 to be reviewed annually	Industrial Department of Uttarakhand	Establishment and support of innovative business with high potential for wealth creation or job creation.
Home-stay Policy	Amended as on 3rd May 2019	Uttarakhand Tourism Development Board	Promote tourism by supporting and encouraging local residents to develop additional infrastructure to be able to offer home-stay to inbound tourists.
Biotechnology Policy	2018-2023	Department of Science and Technology	Establishment and support of joint R&D which will eventually lead to the development of biotechnology-based enterprises in the state.
UKSRLM	Launched as on 3rd June 2011 with NRLM	Rural Development	Formation of women SHGs in rural areas to introduce the rural women to collective entrepreneurship.
RSETI	NARRUDSETI	Rural Development	Skilling of women to encourage them to become micro-entrepreneurs
DDUGKY	25th September 2014	Rural Development	Skilling of rural youth in Uttarakhand.
ILSP	July 2013 till March 2019, extended	Rural Development	Formation of women SHGs in rural areas to introduce the rural women to collective entrepreneurship.
IT Policy	2016-2025	Dept. of Information Technology	Subsidy for rural BPOs. Investment and Patent cost filing subsidies.
UKSDM	Launched in February 2013	Skill Development	Skilling of Uttarakhand youth.

Though the above-mentioned policies and programs have been rolled out, sustainable entrepreneurship development in Uttarakhand will need a transformational approach, *merely* incremental steps may not be able to provide the required growth. The focus must shift from creating 'manufacturing' enterprises to 'knowledge centric' enterprises. The current extended lockdowns have provided the necessary evidence in support of a knowledge centric economy. While the overall industrial activity has taken a hit; IT / ITES, online education, services facilitating remote work, data driven technologies and services, essential for survival goods and hi-tech products and services have all proved to be resilient to the adverse effects of the extended lockdowns. To realize its knowledge economy potential the State must make strategic investments. This requires investments in multi- layered value chain of products (and services) based on the natural strengths of this State. Hallmark of a knowledge economy is that the finite investment gets used up and it generates "knowledge" which is infinite.

Uttarakhand SWOT: Knowledge thus generated provides fuel to shift the economy from traditional manufacturing to more flexible knowledge-centric activities such as design, service sector, hi-tech / unique manufacturing.

A pre-requisite to this transformation is a robust ICT infrastructure across the state. In this age of technology, robust information and communication infrastructure and services are critical requirements for all kinds of business activity. It helps to achieve and maintain information symmetry, access to greater knowledge, tools and better markets. Strategic investments with immediate impact in improving all-weather ICT infrastructure in the State, capacity building of all stakeholders to leverage on the ensuing capacity and ensuring access of reliable ICT services to the masses will be the first major step in the knowledge transformation of the State.

Strengths	**Weakness**
• Unique mountain environment and habitations. • High potential for tourism. • Fresh water resources in the form of rivers and lakes. • Very rich biodiversity. • Diverse climate and geographic features. • High forest cover. • Rich traditional values and customs of environment conservation, education, hospitality. • Well known and well-established places of cultural, historical, archaeological, religious and spiritual significance.	• Poor all weather accessibility due to challenging terrain. • Limited interpretation of nature. • Built environment lacks aesthetics and alignment with the natural beauty. • Lack of inter - department Coordination. • Poor public transport system. • Project implementation and last mile service delivery is a challenge. • Expectation vs Reality mismatch. • Shotgun approach towards marketing, branding and positioning of the state. • Poor availability of health services.
Opportunities	**Threats**
• Large potential for services based on natural advantages such as tourism, ecosystem services and traditional knowledge. • Expatriate community with wide international reach. • Higher literacy rate and mid-skilled workers who can be upskilled. • Conducive natural environment for developing hybrid business models. • Increased spending power in domestic and national economy. • Orientation of service economy.	• Poorly developed urban infrastructure. • Inertia towards technology and concept upgradation. • Disaster and climate change vulnerability. • Competition from other hill states who are doing better in health, sanitation, education and sustainable livelihoods. • Distress migration. • Shotgun approach in public investments in development. • Increasing pollution and other man-made disasters. • High youth unemployment.

State of Uttarakhand is rich also in natural resources, freshwater resources, mineral deposits, forests and biodiversity. Mineral deposits like limestone, marble, rock phosphate, dolomite, magnesite, copper, gypsum, etc are found in Uttarakhand. Species of rare 175 types of aromatic & medicinal plants are found in the State. It has almost all major climatic zones, making it amenable to a variety of commercial opportunities in horticulture, floriculture and agriculture. Challenging geography, beautiful landscape and rich biodiversity combined offer a vast untapped tourism potential in adventure, leisure, and eco-tourism.

To develop and leverage the natural endowments of Uttarakhand would require a redefined strategy and renewed enthusiasm towards entrepreneurship development in the state. Starting with the five "potential" growth drivers, *namely Tourism, Hill Agriculture, Forests, AYUSH and Energy* as identified in the Uttarakhand Vision 2030, a winning strategy would involve the development of **skilled human resource** which would be able to use the **emerging technologies** of the new era (eg: e-commerce, virtual reality, augmented reality, big data, blockchain) to leverage the **rich natural resources and diversity** of Uttarakhand for wealth creation and jobs creation.

Currently, there is a very weak link between the larger industries in Uttarakhand and smaller units / service providers in the state. While the larger industries in the state are from the pharmaceutical, food processing, engineering, IT/ITES sectors and FMCG sectors, the state-run entrepreneurship development programs focus on primary sector and primary level value addition such as making jam, pickles and flour out of the produce. It is time to move beyond jams, pickles and chutneys and explore dehydration, freeze drying, powders, proprietary products based on traditional knowledge, oils and extracts.

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In the absence of value chain and supply chain mapping across sectors the current ecosystem has failed to integrate the smaller enterprises (cottage industry, rura enterprises etc.) into the supply chain / value chain of large industries, as a result of which the benefits of larger industries have not been fully realized. As the rural entrepreneurs are not integrated into the larger supply chains, local entrepreneurs are forced to compete in the market against more established players from other regions. Competitiveness of local businesses is further compromised due to low volumes, low traceability, poor quality orientation of the producer and logistics costs.

Khakhra from Gujarat. Packaging and large-scale marketing of Gujrati delicacy of Khakhra is a very good example. It is prepared by several collectives in multiple flavours and then marketed by companies specializing market outreach. The product is available throughout the country and abr oad. Multiple enterprises work together to form a common value chain.

The general trend of rural entrepreneurship programs being toned down *"to fit the needs of the rural people" needs to be checked. Using the excuse of "rural audience"* state run entrepreneurship development programs often do not address the critical topics of business model, business planning, compliances etc. This compromises the survivability of rural ventures because eventually all entrepreneurs must compete in the larger market and without the required know-how; it is difficult to survive the competition. While it is true that the training program and pedagogy needs to be aligned to the audience, but at the same time the training program must cover all necessary aspects of entrepreneurship. Furthermore, the lack of resource persons and handholding mechanism has further dented the possible outcomes of rural livelihood support programs. As per the data USRLM data from October 2019, out of total required participants of the program, only 20% have

been trained so far. There is a need to address this situation through proper strategy and planning as soon as possible.

Entrepreneurship development at the state level requires a systems level approach with an all-round strategy to effectively engage with all ecosystem partners and nurture a vibrant entrepreneurial ecosystem. As the diagram 1.1 illustrates, a robust entrepreneurship ecosystem allows human resources empowered with the desired knowledge base, financial support and infrastructure to leverage on the available natural resources to reach out to the relevant markets for wealth creation / jobs creation.

Diagram 1.1: Components of a Vibrant Entrepreneurship Ecosystem

There is a need to objectively analyse the commonly discussed opportunities such as hill agriculture, horticulture, tourism etc. While the Uttarakhand Vision 2030 document has successfully identified the "potential" growth drivers of Uttarakhand, there is also a need to identify the current growth drivers and plan for their long-term sustainability. For eg: Hill Agriculture has been identified as one of the 5 growth drivers in Uttarakhand. Primary sector contributes about 10% to the state GDP and at the same time provides employment to approximately 68% of the population. This indicates low productivity and disguised unemployment.

Tourism in Uttarakhand has been identified as a potential growth driver of the state. It contributes 4.4% to the state GDP and provides employment to 2% of the population. This data indicates that while the state has immense potential for tourism, this potential is not being leveraged effectively. To effectively capitalize on this opportunity while ensuring sustainability, requires careful strategy and long-term planning and coordinated multi-departmental efforts at the state level. In the wake of low number of COVID 19 cases in the State, there is an opportunity to market Uttarakhand as a "Safe Tourism" destination - One may wonder, if not in DevBhoomi then where else can one be safe from the vices of the so-called modern lifestyle. The concerned departments will have to play in active role in reaching out to the tourism stakeholders and support them through timely supply of SOPs, policy level support and capacity building support.

> In countries like Japan, young students are encouraged to work as free guides for the incoming tourists. It helps the young students to become self-dependent. Their communication skills get improved andthey also get exposed to new cultures.

Even though the Education sector contributes more than double of what tourism contributes to the state economy, it is not considered as a growth driver in the state. The COVID induced lockdowns have presented a unique opportunity to the state. With the natural promotion of online education during the lockdowns, the state government may consider rolling out policy measures to bring online education (in suitable streams) at par with the physical attendance-based programs in the state. Similar bold opportunities are also available in promoting home schooling companies to set up outdoor experience centres in the state. Several outdoor orientation programs are already running in

Uttarkashi, Joshimath, Lata and other remoter parts of the state.

A three-step approach is required to begin the transformation:

1. Identify the current growth drivers and further strengthen the ecosystem to support their growth. These current growth drivers will provide the foundation from which the potential growth drivers could be explored.

2. Strengthen the policy ecosystem to ensure sustainability of the current growth drivers and align them to enable the realization of the "potential" growth drivers.

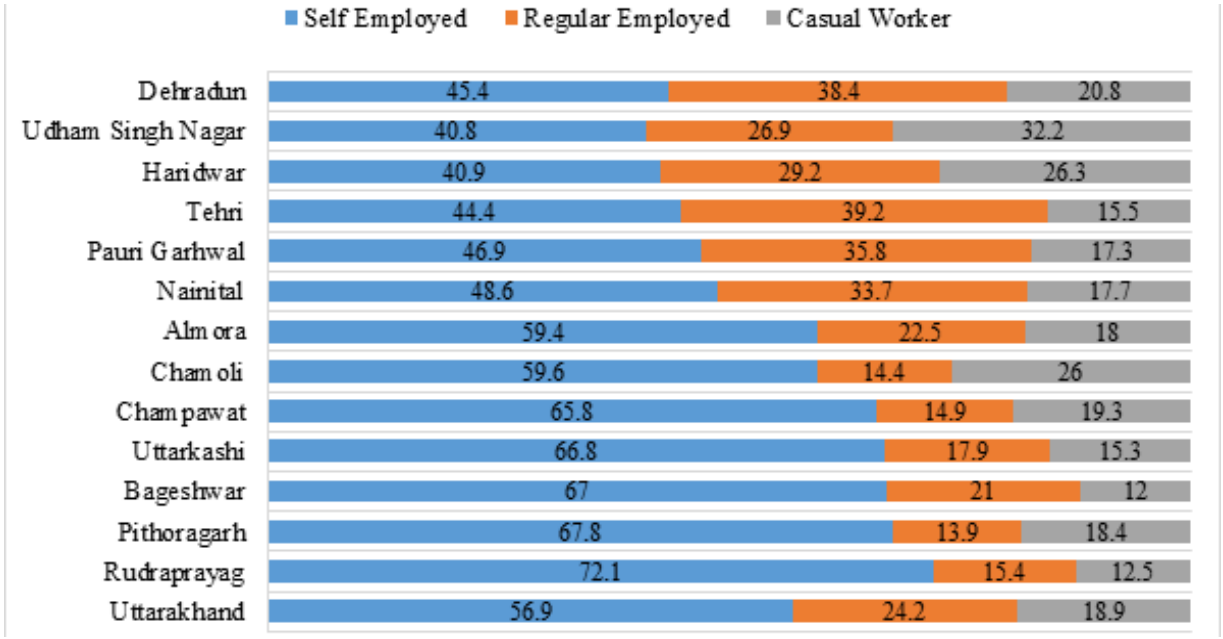
3.Timely and effective update of the ecosystem to ensure the long term sustainability

For eg: If Education sector is one of the current growth drivers in the state, then the policy ecosystem must ensure: a) the sector remains attractive and sustainable, b) Education is aligned to the 5 potential growth drivers so that the required technical and functional knowledge base is available within the state and c) Education sector must be updated and upgraded to ensure that the state retains its competitive advantage. Such an approach will strengthen the overall livelihoods (entrepreneurship and employment) landscape of the state.

Human Capital in Uttarakhand

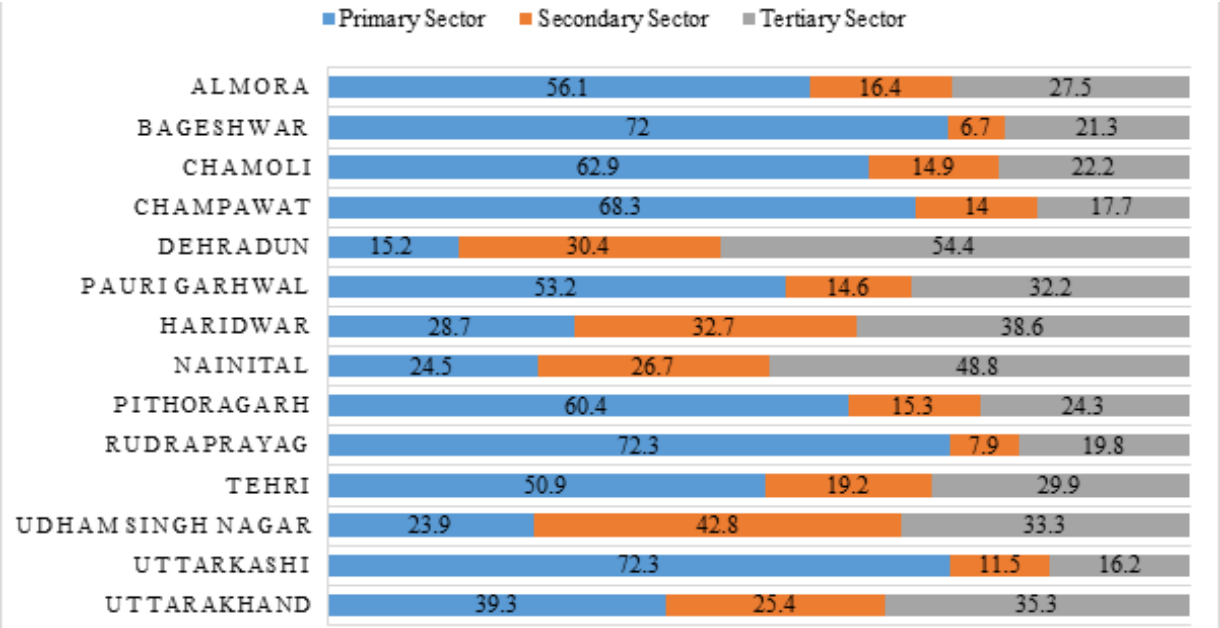
Development and optimized leverage of human capital has a positive effect on economic growth. Investments made in developing human capital have a proven track record of creating better livelihoods globally. It can further propel labour intensive economies to transform into knowledge economies in the longer run. It must be stressed that in the absence of well-developed human capital any of the other investments such as financial, infrastructure etc. fail to provide the desired results. For fast growing developing economies such as Uttarakhand, the need to develop human capital cannot be overrated.

Fig 6.1: District-wise Employment Status (%), 2017



With a literacy rate of 79.63 % Uttarakhand has educated population and a high percentage of medium skilled workers throughout the state.

Fig 6.2: District - wise Distribution of Industry (%), 2017

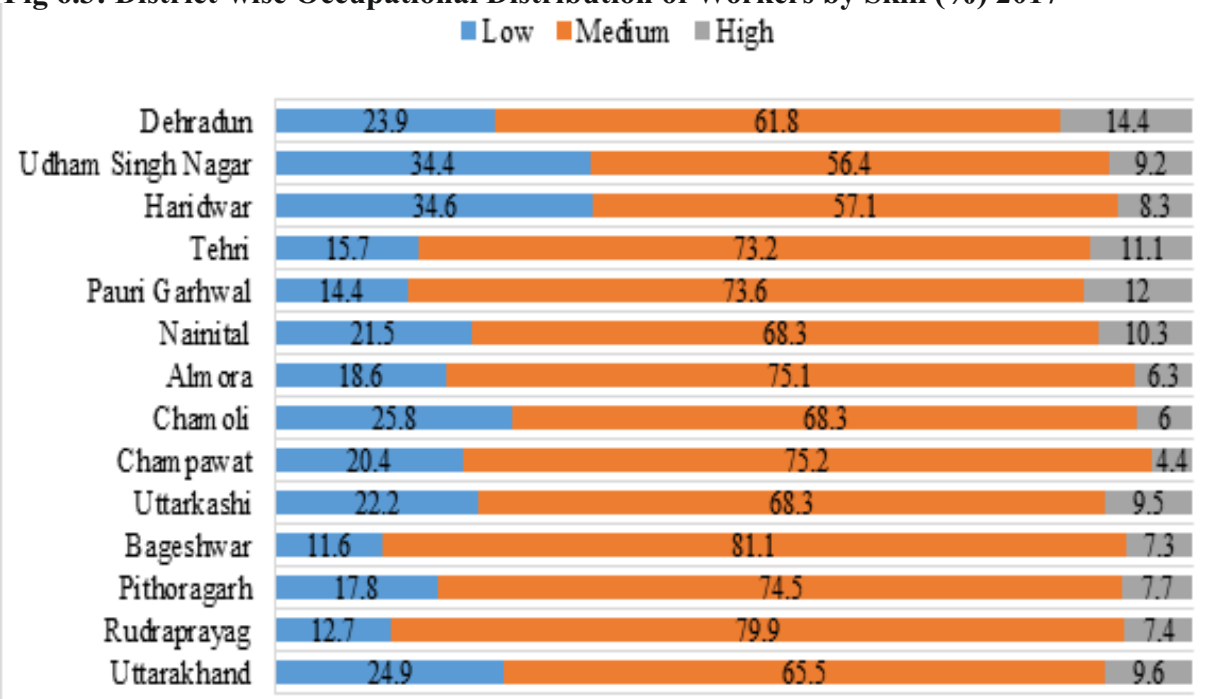


As we look at the employment status and per capita income in the state an interesting trend emerges. While the hill districts have a higher percentage of people engaged in self-employment, the per capita income in the hills is lower. Primary sector being the largest employer in the state is also the lowest contributor to the state GDP. This indicates under-developed local entrepreneurship opportunities in the hill districts and inadequate access to markets. Part of this disguised unemployed labour could be diverted towards processing and value addition activities.

Smaller European countries such as Netherlands, Finland, Latvia, Estonia etc. have successfully demonstrated that integration of technology in agriculture gives very good returns and promotes rational engagement of human resources. The surplus labour can then be re-deployed across the value chain. Promoting Farmer Producer Organisations can serve this purpose in India.

Youth unemployment is also a cause of concern. Even in Dehradun (State capital) 30% youth is unemployed and hence is at a risk of succumbing to various personal and social pressures. With more than 50% mid-skilled workforce in each district the livelihoods landscape is commonly seen as complicated. The mid-skilled workforce refuses to engage in low-skilled jobs and there are not enough job providers to absorb a highly skilled workforce. The same "complicated" scenario can also be an opportunity to a) diversify the knowledge base to introduce new livelihood opportunities and b) convert some proportion of this mid-skilled workforce into demand based high skilled workforce so that trickle-down effect of successful demand based skilling at higher level may also spur similar activities for mid-skill and low-skill training programs. There is an urgent need to switch from *supply-based* skilling to *demand-based* skilling. Globally, there are no examples of successful *supply-based* public sector skilling programs. All successful skilling programs have had a strong *demand-based* approach and strong integration of the private sector in the program.

Fig 6.3: District-wise Occupational Distribution of Workers by Skill (%) 2017



Project HIMAYAT in Jammu & Kashmir which focussed on placement linked skill development with more than 78% placement record of youth skille d and gainfully employed 1 year after skilling program is a good example of skilling, livelihoods and protection of youth from social evils.

Financial Resources

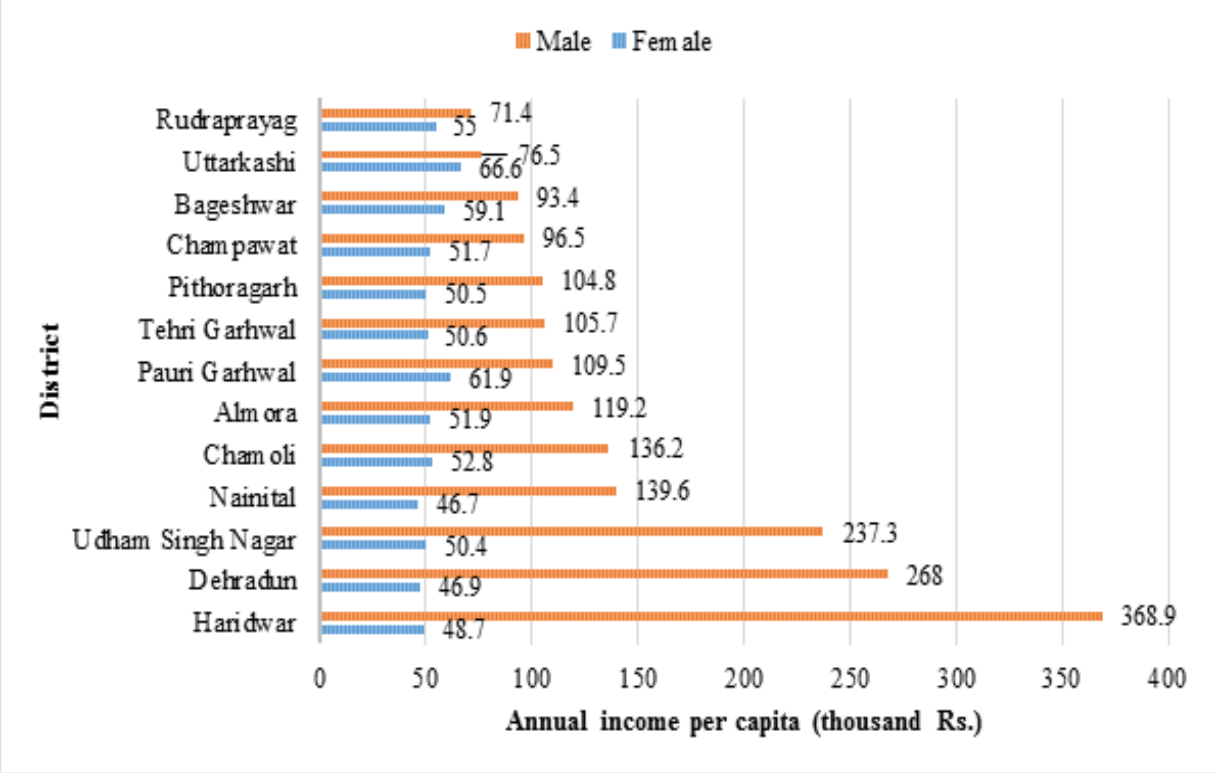
All entrepreneurial ventures require financial support in the various stages of their development. Most founders / entrepreneurs depend on the availability of financial support on business-friendly terms to fuel their company's growth. The role of public sector / government funding agencies becomes increasingly important in a) providing the right kind of financial support at the right time and b) to protect entrepreneurs from predatory market practices (e.g. loan sharks) etc.

Traditionally, most businesses in Uttarakhand have been dependent on the informal sector and the banking system to raise "debt" for their financial requirements and only recently funding models such as "equity", "convertible debt" and other specialist funding instruments are being explored. There is a need to raise awareness about the alternate ways of fundraising in the state.

Several social impact ventures are active in states such as Maharashtra, Gujarat, Kerala etc, where the organizati ons partner with the government departments to ensure last mile delivery of their services. Some of the top performing organizations can be invited and partner with the Uttarakhand government in driving financial inclusion and awareness of schemes and programs

As per the data available on MUDRA portal, Uttarakhand, which represents 0.83% of the country's population has availed only 0.71% of MUDRA loans sanctioned in the past four years. For a state where more than 50% population is self-employed, this number is low. For perspective, Karnataka represent only 5% of the national population but has availed more than 10% of MUDRA loans sanctioned. Moreover, there is a declining trend and the number of MUDRA loans sanctioned in 2019 is half of the number of loans sanctioned in 2015. This is mostly attributed to the falling demand, people losing interest in the scheme and difficulties at the bank branch level. Similarly, as per the latest SLBC data (top 3 banks) only 55% of the SHGs have become eligible for credit linkage and out of credit linked SHGs almost 77% percent of women SHGs have outstanding with the banks.

Fig 6.4: Estimated per capital annual income 2017



Situation for women entrepreneurs is made even more precarious because their annual income per capita across the state is very low. In addition to restricting the ability to take independent entrepreneurial decisions, this directly affects their ability to raise debt for their ventures - individually as well as in collectives. Hence, care must be taken that policy interventions must deliver results in short term, otherwise the target group becomes disillusioned and loses commitment to training and follow-up action.

There is a need to develop fiscal discipline and financial literacy in the entrepreneur community in the state. Without fiscal discipline and good banking relations it will become increasingly difficult for small entrepreneurs to get favourable response from banks. There is a need of sensitization and awareness building right from the training level. These topics must be covered as part of the training and capacity building programs.

Physical Infrastructure

Well-developed physical infrastructure including transportation, logistics, power and communication is well recognized as a growth enabler for sustainable entrepreneurship development. Inadequate infrastructure increases the transaction costs and creates an unproductive drain of capital, which ultimately affects the competitiveness of the industry and its growth potential.

As a net garbage negative country, Sweden has shown successfully that through circular economy, waste management can be a profitable business. State of Tamil Nadu has successfully demonstrated village level waste management in India.

With its hill geography and challenges of multiple climate zones and diverse terrain; infrastructure development especially in terms of suitable logistics, transportation, power and communication requires innovative models to fill the gaps. While there is decent road connectivity in the State and over 97% households have water and electricity supply, much requires to be done in the area of reliable high-speed Internet connectivity, waste management and disaster preparedness.

For States as disaster prone as Uttarakhand, disaster resilience and climate change adaptations must be a part of the core state planning. The ongoing COVID19 pandemic has clearly showcased that smaller economies have limited resilience to large-scale disruptions such as disasters or climate change effects and may fail to recover in case of a catastrophe. For eg: As a result of the 2013 natural disaster, Primary Sector activities in Chamoli district were almost wiped out, even 7 years later the primary sector is still facing the post disaster impact and is struggling to recover from the loss. Many residents of the district have chosen to migrate or have opted for other livelihood options.

Intellectual Property / Knowledge Base

A well-developed knowledge base protected through relevant intellectual property rights allow entrepreneurs to develop innovative products and services, which can compete effectively against larger companies. IPR allow the entrepreneurs and communities to protect their unique offerings by seeking to prevent unauthorized copying, counter faking, piracy and any losses caused using non-genuine products / services. From 2016-17 to 2019-20, 392 patents were filed from Uttarakhand and only 19 were granted. Though this number indicates good awareness about patents, it also suggests that there is a need for genuine innovators and IPR professionals in the state.

> Startup Goa promotes the IPR and its commercialization by utilizing a 2 step strategy. Provisional patent applications are funded by the state government. The patent owners are then encouraged to raise money to further develop their invention and commercialize it. Start-up policy of Goa further supports the full patent applications.

For Uttarakhand to leverage its natural resources, it is critical to also integrate the use and application of emerging technologies in governance and entrepreneurship development. With the ever-changing competition landscape and the era of global markets, as per several American and Chinese research papers *the pace of adoption of emerging technologies is one of the key factors, which determines the survival of enterprises*. Key technologies, which can help transform the Uttarakhand economy, are as follows:

Name of the Technology	Potential Areas Of Application in Uttarakhand
Big Data	Policy making, increased primary sector productivity.
Smart Cities	Upgraded and well-developed urban infrastructure.
Block Chain	Land records, personnel records, traceability of primary sector produce.
Artificial Intelligence	Decision making, law and order maintenance, policy making, data analysis.
Renewable Energy / Clean Tech	Solar energy, small hydropower, wind energy, other renewable energy sources.
Fin Tech	Financial inclusion, easy access to basic banking services, access to investments.
E-commerce	Access to the global markets, IT and ITES services.
Robotics	Employment of robots in hazardous situations.
3-D Printing	Rapid prototyping, product development, educational.
Virtual Reality	Tourism, education, last mile customer service.
Augmented Reality	Education, tourism, last mile customer service.
Shared Economy	Business centres, co-working spaces, common facility centres etc.
Internet of Things (IoT)	Sensor based technologies and products for process monitoring, data collection, early warning systems.
NanoTechnology / 2D Materials	Water management, air pollution management, surface hardening and a variety of other uses.
Biotechnology / Genetics	Specialty products, productivity enhancement, agriculture/horticulture/dairy/fish/silk etc.
Agriculture Innovation	Making agriculture sustainable, increase farmers income.
Waste Management	Ensure safe and hygienic living conditions for the masses, waste to wealth.

Blockchain based tracking of coffee supply chain by MNCs is a good example of how technology enables transformation right from the grass root level. The MNCs get the benefit of traceability, quality and standardization and hence are willing to pay for technology. The farmers (grass root level workers) get the benefit of timely payments and direct interface with the buyer, so they learn to adopt and use this technology.

One way to boost innovation and IPR is to focus on some core sectors and identify the value drivers for the entire supply chain. Table below presents some value drivers, which can be used to give a boost to entrepreneurial innovation in Uttarakhand. These opportunities also suggest clear intersection of the grassroot level and hi-technology resources.

Value Driver	Entrepreneurial Opportunities
Resource Management	Consumption Optimization
	Regulate energy and water consumption
	Intelligent IoT based monitoring systems
	Real - time data gathering, analysis and reporting
Process Management	Efficiency improvements
	Reduce breakdowns and turnaround time
	VR and AR based learning and training programs
Asset Utilization	Sharing of high cost assets among multiple users
	Machine flexibility
	Predictive maintenance
	AR based asset service, repair and maintenance
Labour Optimization	Human - Machine interaction
	Safety of human workers
	Remote monitoring of labour
	Automation
	Digital labour force management
Inventory Management	Real - time data gathering, analysis and reporting
	Supply chain strengthening
Total Quality Management	Digital quality control
	Analytical quality improvement
	Quality improvement services
Supply / Demand Match	E-commerce and internet-based technologies
	Business development
	Organization of fairs and expos
Time to Market Optimization	Sector specific support services
	Concurrent engineering
	Value addition and product upcycle
After Sales Service	Service centres
	VR and AR guided service and maintenance
	Local support for manufacturer responsibility programs

Way Forward:

Following steps can be taken immediately to transform the entrepreneurial landscape in Uttarakhand:

- Shift from production centric /manufacturing centric economic outlook to knowledge centric economic outlook for the state.
- Value Chain / Supply Chain analysis to connect ***cottage industry*** – MSME – large industries in an integrated chain so that the natural strengths of the state can be leveraged properly.
- Mapping of essential for survival and daily use items and aligned relevant skilling opportunities to promote local manufacturing and local consumption of such items.
- Promotion of community run camping grounds, community kitchens, home-stays, hostels, logistics aggregators etc.
- Re-examine the entrepreneurship development programs and do the necessary upgrades in terms of content and training methodology.
- Develop and introduce a course on entrepreneurship across the state high schools, technical education institutes and higher education institutes.
- Develop and Introduce "career awareness program" in education institutes.
- Introduce *"Entrepreneur Track"* for researchers (Post graduate and PhD level) who are interested in exploring entrepreneurship as a career, so that they are well equipped with the required knowledge to start their own ventures based on their research.
- Youth cadre viz NCC, NSS members could to be trained & deployed for promotion of entrepreneurship development programs, policies and events at the community level.
- Develop & maintain a *-for public* database successful/innovative entrepreneurial initiatives across the state, so that local aspirants get information about local role modelsthey can look up to.
- Develop a Village level skills register to improve planning of micro entrepr--eneurship development strategies for rural areas.
- Develop a *"Technology Priority* and a *"Skills Priority Register"* to forecast and track the impact of upcoming technologies and corresponding skill requirements, which are critical for industries in Uttarakhand.
- Promote research on hill specific problems and develop specialist knowledge for knowledge exports. Several smaller European countries have successfully implemented such models, for eg: Finland exports its "Snow-how" as a major knowledge export to other countries who wish to learn snow management.
- Set-up a professionally run state level body to co-ordinate, monitor, evaluate and upgrade all entrepreneurship development activities in the state.
- Develop and maintain an Entrepr--eneurship Support Platform in the form of a web portal and physical ESP centres. This platform will provide information and application assistance related to all government schemes aimed at promoting entrepreneurship. Other business support services such as business plan assistance, project report assistance, recruitment assistance etc could also be provided through such a platform. Already existing CSCs can be strengthened to also work as ESP centres.
- Develop and introduce an immersion program for the students of higher and technical education to work with the SHGs and village level entrepreneurs.
- Introduction of a post-college / post-skilling finishing course for the youth where they work with the entrepreneurial collectives for a period of 6 months and get recognized for their contributions.
- Facilitate awareness building about ***latest technologies and concepts*** (such as Industry 4.0, IoT, Big Data, Augmented Reality, Virtual Reality, Artificial Intelligence etc) and ensure their positive impact on the industry in Uttarakhand.
- Facilitate youth interaction and idea exchange through state level hackathons, idea challenges and innovation mela.

CHAPTER 7
Social Sector Scenario
7.1 Higher and Technical Education in Uttarakhand

The total number of students enrolled in Higher Education in Uttarakhand as according to the Report of All India Survey on Higher Education (AISHE) for 2018-19 stands at 2,53,273 amongst which 1,25,037 are enrolled in private institutions, and 1,28,236 in government institutions. This number can go higher as AISHE captured the data only from those who responded to the survey. Enrolment in higher education at various levels is also encouraging with a total enrolment of 76,615 among which 462 are enrolled in PhD, 27 in MPhil and 71926 in Postgraduate levels. Another 19,612 students are enrolled in Postgraduate programmes through distance mode. The estimated number of enrolment in the colleges in Uttarakhand in Postgraduate programmes stands at 31,082 (Male: 12285, Female: 18797) which also indicates that women are surging ahead of men in college education. It also supports an earlier study that showed that the female enrolment surpasses male enrolment in almost every hill district. This pleasant number is rather attributed to the perennial reality of the hills - males migrating to the urban plains for both education as well as for jobs. The Gross Enrolment Ratio (GER) of Uttarakhand in Higher Education (18-23 years) stands at an overall 39.1% which is higher than the national figure of 26.3%.

Pandey, T. D. and Pathak, J, (2018). Higher Education and Sustainable Development in Uttarakhand. In *Research, 3(3), pp. 79-83.* Gross Enrolment Ratio (GER) is statistical measure for determining number of students enrolled in undergraduate, postgraduate and research-level studies within country and expressed as a percentage of population. India is aiming to attain GER of 30% by 2020, but it is still far behind countries like China with GER of 43.39% and US with 85.8%.

Table 7.1: Number of Universities in Uttarakhand (2018-19)

Institute	No.
Central University	**1**
Central Open University	
Institute of National Importance	4
State Public University	10
Institute under state Legislature Act	
State Open University	1
State Private University	17
State Private Open University	
[illegible]	1
Deemed University – Government Aided	1
Deemed University – Private	1
Grand Total	36

Table 7.2: Enrollment in Private and Government Colleges in Uttarakhand (2018 – 19)

Institute	No.
Private Un-Aided	**78278**
Private Aided	46759
Total Private	125037
Government	128236
Total	253273

Source: AISHE

Table 7.3: Enrolment at Various Levels of Higher Education in Uttarakhand

Course	Male	Female	Total
Ph.D.	2903	1759	4662
M.Phil.	18	9	27
Post Graduate	32342	39584	71926
Under Graduate	177767	174137	351904
PG Diploma	1174	1105	2279
Diploma	23572	8585	32157

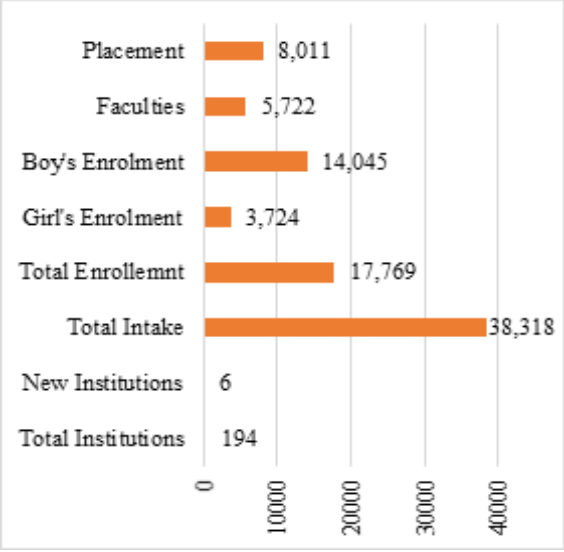
Source: AISGE 2018-19

In the area of Technical Education, the most striking fact that emerges is the low capacity utilization in undergraduate and postgraduate

evel institutions in the State. Out of the total intake capacity of 38,318 seats, only 17,769 students (Boys: 14,045, Girls: 3,724) were enrolled during 2018-19. Out of these enrolled students, only 8,011 found job placements at the time of graduation (See figure). This trend is not unusual as per the All India Council for Technical Education (AICTE) Report of 2019 that indicated that all India Capacity Vs. Enrolment stood at as low as 49.8%. Traditional engineering disciplines such as Mechanical, Electrical, Civil and Electronics engineering are increasingly witnessing low enrolment whereas the disciplines like Computer Science is still retaining some interest. As highlighted by the AICTE Report (2019), low enrolment, minimal placements, and low employability will pose more challenges in the coming years as employment generation will be an uphill task for the State. Therefore, the technical institutions in the State have to rethink their strategies and proactively redefine their teaching-learning and quality scenarios with a view to incorporate the 'employability' aspects within

the subjects and curriculums they offer. Such a strategic reform can be facilitated by the Government and should invariably involve other stakeholders like industry, local entrepreneurs and SMEs.

Fig 7.1: Status of Technical Institutions in Uttarakhand during 2018-19



Source: AICTE

Three major emerging scenarios across the world are going to guide any State to reorient its education and training sectors – especially the higher education and technical education. The State of Uttarakhand should, therefore, rethink how its youths are educated, trained and developed today so that they fit into the workspaces of the future. The policy directions in this regard must be comprehensive, encompassing the complete life cycle of an individual and, in the larger scenario, the entire populations in the State. Three major paradigm shifts are happening at present in - (i) technology and globalisation, (ii) education and training ecosystems (iii) repositioning gender as a paid workforce and (iv) equip institutions and human resources to deliver qulity education in COVID-19 like situation.

Digital education in the State is in its transformational phase and a lot more can be done by all the stakeholders in the education ecosystem i.e. government, EdTech providers, educational institutions, startups, etc. to ensure that digital tools are accessible to every learner in the State. In fact, COVID-19 pandemic has pushed educational institutes and policy mekers to adopt alternative methods of teaching and learning. The government runs a large part of education system. The government and private players must adopt digital education and make the platform, content and methods available to every school and clolleges. The State governments must take a lead in demonstrating adoption of digital education that may be followed by the rest of the stakeholders.

Technology and globalization, first of all, are substantially changing the business models in all sectors, removing traditional jobs and at the same time creating new ones. While millions of old job descriptions are vanishing gradually from the workspaces, completely new sets of work and skillsets are being created within existing jobs. Some researchers predicted that half of the current jobs will disappear soon and many other conservatively predicted that 9% of today's

jobs will be impacted by automation. The bigger picture that emerges is that by 2020, one-third of the existing skillsets required to perform today's jobs will be changed.

Education and training systems scenario prevailing in Uttarakhand has remained largely conventional and producing certificate, diploma and degree 'holders' who are unemployable without any further value addition in terms of new skillsets. Moreover, the open and distance education avenues that are on offer today are not geared towards suitable adult training and 'in-demand' skills that can help the users in the new job contexts.

Repositioning Women's Role in Work-force: In spite of decades of progress in technical education and India's strides in Information Technology sector, the traditional cultural perceptions and institutional inertia creates additional challenges for women. Despite higher enrolment and successes in acquiring education, women continue to be underpaid and underrepresented in the job market. Globally, women have less than two-thirds of the economic opportunity that men have, and the rate is bound to be much lower in interior areas in a hilly State like Uttarakhand.

These three-pronged challenges are further impacted by the challenges in Uttarakhand due to its geographical location, demographic, social and economic factors. However, these can be mitigated through strategic actions, a clear way forward backed by a sound 'Theory of Change' and an enabling policy environment. The need of the hour is to act now, using this opportunity to proactively transform and reform higher and technical education scenario in the State that will place the State ahead of its other counterparts in the country and accelerate a positive value-addition to the existing educational and pedagogic practices that will, in the long run, enable the people of the State to live up to their full potential. It will need a sustained collective engagement among all the stakeholders – government, citizens, business leaders, policymakers, educational institutions and academics - for priorities in a coordinated action on a future-ready agenda

. In this chapter of the Uttarakhand Economic Survey 2019-20,, we would address the most pertinent issues requiring broad-based policy directions in order to answer the following major questions:

- What will be the key changes to build a future-ready higher education ecosystem in the State?
- What will be the key strategies for transforming the existing educational institutions and programmes at various levels and responding to the changing nature of work?
- What will be the key features of a robust reform process in the higher and technical education sector?

In each chapter, the key issues are discussed briefly, followed by the major policy implications for the State, and a 'Theory of Change' framework. In addition, the underlying assumption is that the eventual fallouts of the Fourth Industrial Revolution (Industry 4.0) and the social disparity it might unfold, offers the State an opportunity to bring in these strategic changes to ensure that the benefits of new technologies are distributed widely. At the same time, it also presents a concrete action plan to scale and accelerate the reform and spread new opportunities more rapidly among the population. It is our hope that this specific review will encourage a shared vision of priorities for reform within the education sector as a whole and support the Government in advocating for investments in a futuristic human capital development agenda in the context of the Fourth Industrial Revolution.

Changing Nature of Work

The *World Development Report (WDR) 2019: The Changing Nature of Work* studies how the nature of work is changing as a result of advances in technology today. Fears that robots will take away jobs from people have dominated the discussion over the future of work, but the World Development Report 2019 finds that on balance this appears to be unfounded. Work is constantly reshaped by technological progress. Firms adopt new ways of production, markets expand, and societies evolve. Overall, technology brings

opportunity, paving the way to create new jobs, increase productivity, and deliver effective public services. Firms can grow rapidly thanks to digital transformation, expanding their boundaries and reshaping traditional production patterns. The rise of the digital platform enterprises means that technological effects reach more people faster than ever before.

Technology is changing the skills that employers seek. Workers need to be better at complex problem-solving, teamwork and adaptability. Digital technology is also changing how people work and the terms on which they work. Even in advanced economies, short-term work, often found through online platforms, is posing similar challenges to those faced by the world's informal workers. The Report analyses these changes and considers how governments can best respond. Investing in human capital must be a priority for governments in order for workers to build skills in demand in the labour market. In addition, governments need to enhance social protection and extend it to all people in society, irrespective of the terms on which they work. To fund these investments in human capital and social protection, the Report offers some suggestions as to how governments can mobilize additional revenues by increasing the tax base.

Artificial intelligence (AI) is the new buzzword that has caught the attention of all by its exponential growth in all walks of human activities in recent times. It has now intervened in areas of human actions that were hitherto unknown or unimagined like legal services, linguistics, language translation, medical diagnosis and intelligent games. This has led many to apprehend that in coming days AI will perhaps replace a large number of workers giving rise to more unemployment in various sectors as human beings will be unable to compete with the efficiency and cost-effectiveness of machines. These fears may not be completely baseless as we see how AI is replacing many old jobs held by humans so far, but it is far from truth to say that AI will ultimately abolish all meaningful jobs from the world of work. If we look into the history, we have seen many such technological breakthroughs in the past, which reduced the number of manual workers on the grounds in terms of absolute numbers but could never make all workers unemployed. Even in the wake of new technologies such as steam power and electricity, employment still hovered around 5-10% in the US where these technologies made the strongest forays. When computers were being introduced in developing countries like India, there was a strong fear that in such a populace nation it will make millions jobless overnight. Yet we are witness to how India made its successful journey into the Information Technology sector by producing the largest contingent of IT workforce. The bottom line is, AI will be another enabling tool for the intelligent humans who can use it to their advantage and create new jobs that need their talent and skills to manage the AI-based environment in the future. In other words, AI will open new avenues, require people to unlearn and relearn new ways of doing jobs that will be moving various sectors in the future. It might change the way some are jobs are done today and in fact, creating more meaningful jobs with different skillsets for millions who will master the ways AI can be used to do these jobs.

In coming days, AI might help many lawyers to do their case preparations and evidence analysis, case citations and make their legal works more accurate, relevant and save much time and money.

hat is lost in pursuing a case from a wrong angle. It doesn't mean AI will replace the actual job of lawyers rather it will make those lawyers, who can effectively use AI-based legal tools, more efficient and successful in giving relief to their clients. To give another example, we can talk about ATMs that are now omnipresent in any country. At one time many people feared that it will hugely reduce the number of bank workers and millions will be jobless. But in reality, we have seen more bank workers were needed as the banks increased their branches and services, leveraging the lowered cost of operating new branches. When technologies helped people

and organisations to save money or serve more clients, they used the savings to create new services or expanding their existing businesses, leading to the creation of more jobs. To extend this scenario to the other example we discussed here, we can say that as legal services become more delivery-oriented and paralegal works becomes cheaper, we can see more cases coming to legal firms who will ultimately need more lawyers. After all, AI can prepare your legal case more efficiently but you need a human lawyer to argue your case in the courts.

Some may try to argue that as AI will need different or additional skillsets to perform one's job, it might eradicate low-skill jobs. But this is not tenable as workers in all stages and sectors are always ready to adapt to new changes as it is a matter of their survival and human beings are ingenious in nature to master new challenges at the workplace. AI will rather create more job opportunities for those who are ready to walk that extra mile and deliver services more efficiently. A recently published report by Accenture entitled "Reworking the Revolution" (Jan 2018) indicates that AI could increase employment by 10% and push revenues by 38% over the next five years. The Report, based on extensive research with industry leaders and employees, predicts that if a company invests in AI and necessary skill training they can generate billions in revenues and thousands of new jobs. The reports also found that 45% of the workers who were surveyed believed that AI will make their performance better.

Coming to the context of India, the emergence of AI reasonably brought the fear of losing jobs, closer home. The recent National Sample Survey Office's (NSSO) job survey for 2017-18 reported a four-decade-high unemployment rate*(India Today, 31 May 2019)*. A study by Teamlease Services *(Employment Outlook Report HY1 FY20)* estimates that about 52 to 69% of traditional jobs in sectors such as IT, financial services, manufacturing, transportation, packaging and shipping will be impacted by the introduction of AI in coming days. But the report also indicated that AI will create newer job opportunities, occupational categories will change dramatically as also reported earlier (McKinsey Global Institute report - *Jobs lost, Jobs Gained*, 2016). Another study projected that by 2022, in India 9% total workforce will be doing newly created jobs that do not exist today and 37% will be doing jobs that will need new skillsets (EY-Nasscom report - *Future of Jobs in India*, Dec, 2017). A study conducted by the All India Management Association (AIMA) and PwC reported that companies in India are benefiting from AI solutions to increase their productivity and creating scope for higher-value-added jobs *(How AI is reshaping jobs in India; Sept, 2018)*. An entry-level data entry operator's job might be diminishing due to AI applications but at the same time new jobs for data-validation clerks will be created. Notwithstanding the disruptive nature of AI in the job market, it will further enhance the roles of humans retained for specific expertise. Rather a fear now lurks that there may be an acute shortage of talent qualified enough to fill the new roles and nature of jobs that AI will bring in India and the world over. We can see that technological advances across the sectors, especially in Industry 4.0, will not eliminate all meaningful jobs but it will create new roles, responsibilities and set forth a new workforce mix. To fit into that new workforce around increasing use of new technologies like AI, we will need upskilling of the existing educated youths, workers and fresh aspirants, and they will need to acquire a new set of skills to secure the new jobs that will be created. Technological applications are, no doubt, growing in leaps and bounds, but they are also creating new job descriptions that will demand professionals trained in new skills who can help organisations to manage the technology-mediated activities.

Need for a Reskilling Agenda

Børge Brende, President of the World Economic Forum rightly pointed out that we need a reskilling revolution across the education and training sectors to face the

challenges of Globalization 4.0 and it needs a policy direction to invest in people to create certain value addition in existing human capital. Managing that change will require not just new policy frameworks for national and State governments, but also a new model of education, complete with targeted programmes for teaching new skills. With advances in technologies, increase in peoples' average lifespan and ageing societies, we will have to redesign our approach to education and pedagogy to make best of the new opportunities that await us, while avoiding the kind of disruptions (in employment/jobs) that we are witnessing today.

This transformation should start by setting a new agenda that our human resource development efforts are not limited to providing knowledge and basic skills and certifications but to respond to systemic shifts, it also empowers them to take part in the emerging areas of economic activities.

While the basic structures, levels and categories of mainstream education like Arts, Science, Commerce or Masters, MPhil, PhD etc. will remain critical for all, the system must also address the impact of new technologies of the Industry 4.0 on labour markets. Education policy reform, therefore, should now move towards providing lifelong learning and reskilling initiatives so that individuals (say, graduates of traditional universities/courses) have access to equip themselves with new skills for a competitive world of work.

This policy reform will be unique in many ways.

One, it will be a State-wide, truly interdisciplinary synergic process where sociology will meet technology, computer science with meet history and so on to find out how each domain can contribute towards identifying those futuristic changes that will be needed to prepare our students for the future. Till now, subjects and domains were watertight, especially at the time of reviewing the course contents, as each one guarded their territories fiercely. Second, to make the process more participatory, the State should adopt an innovative methodology called *"Future Search"* that follows a 'whole system' approach (say, higher education) to explore participants' past, present and desired future.

Third, the policy framework should not stop at identifying the changes required, but as a part of the 'future search' process, it should proceed towards action planning for the participants-stakeholders.

Fourth, to avoid the common pitfalls of system-wide review process which often turns into some power struggle between participants or instructions, this new education reform process should look for synergies and common grounds instead of taking a conflict-resolution route and build a common understanding across subjects, disciplines and domains to chart a common agenda, viable strategies and take responsibilities to move forward.

The Fourth Industrial Revolution is causing a large-scale decline in some roles as they become redundant or automated. According to the Future of Jobs Report (2018), 75 million jobs are expected to be displaced by 2022 in 20 major economies. At the same time, technological advances and new ways of working could also create 133 million new roles, driven by large-scale growth in new products and services that would allow people to work with machines and algorithms to meet the demands of demographic shifts and economic changes. To proactively realise the benefits of these changes, our future generation of 'educated youths' will need reskilling and upskilling by 2030. Creating a reskilling revolution will require policy changes at all levels – education departments, universities and institutions and how they interact with enterprises, employers and partner networks. While businesses are working to create new economies of scale, the governments must join this effort, by reskilling exiting 'degree holders' while incorporating new dynamics of change in the traditional departments and trades. It is imperative that the traditional institutions in the State – colleges, universities, polytechnics, engineering colleges – must start mainstreaming reskilling to run parallel to

their conventional courses. The bottom line is that the just an MA in History will not work anymore in emerging workspaces but a graduate with skill in "digital historiography' will surely be in demand.

Learning Outcomes and Wider Use of ICT in Education

Quality of education continues to be an issue of great concern. It is the key to success of students, hence high on the agenda of parents cutting across different strata, class, area, and religion.

The Annual Status of Education Report – 2017 reveals some disturbing statistics about the performance of youth in the age group of 14 to 18 in the State:

- Almost 50% could not do division calculations. A similar % age could not do adding, weighting tasks.
- Almost 27% could not read English sentences.
- 36.3% of them never used computers. 38.9% never used internet.
- 67% could not do proper length measurement and 55% were not apt at applying unitary methods.

One of the factors considered to assess quality of education in the MHRD, GoI publication "Education Statistics at a Glance – 2018", was performance of class X students in four subject viz. English, Mathematics, Science and Social Science. It reveals that in all these subjects, State's performance was at par with Himachal Pradesh but lower than Sikkim and the national average.

Adoption of E-Based learning and using updated ICT to address the shortage of teachers. E-based computer-aided learning has gained traction right from elementary level with availability of competing solutions. State will lag if appropriate initiatives are not taken in right earnest to provide computers in schools, evolve curriculum and provide trained computer teachers at least from upper primary level onwards. Up-graded and interactive information technology could also be used to teach science and other subjects in areas facing shortage of teachers.

Smart Classrooms are being introduced in the State. However, its pace is to be expedited to take students to a level higher and build their competitive edge.

State may obtain support of foundations supporting ICT based learning solutions in schools such as programmes run by Hans Foundation, Azim Premji Foundation, RightToRead and several such initiatives in the country.

Policy Direction 1

We propose that the education department in collaboration with the educational institutions should undertake a major exercise to 'rethink' the higher education programmes across the levels (undergraduate, postgraduate, research) to identify the changes happening the workplaces and relate them to mainstream programmes offered in our colleges and universities. Through an extensive participatory consultative process with an interdisciplinary approach, it is necessary to examine what can a student look for in our colleges and universities to acquire those 'value-added skills' and how our traditional subject areas and institutions can help them in this journey.

In addition, such measures should be complemented by strategic rethinking on how work is regulated and which areas of job creation could enhance societal benefits. A recent white paper suggests that countries should work to increase public and private investment in three areas: people's capabilities, institutions and rules related to work, and sectors that are poised for growth and that benefit society, including health care, education, water, energy, and digital and transport infrastructure.

Towards this reform agenda, the higher and technical education departments, directorates, private sector professionals, universities and institutions (both State and central) should create a joint platform such as *State Education*

Sector Reform Council for such an alliance to urgently incorporate the new/potential Industry 4.0 skills for today's enrolled students as well as designing a sustainable "foundation" of skill-education that will run across disciplines for the future. The proposed platform will serve as a high-level task force to focus fragmented actions within different institutions to address future-oriented skills development, while at the same time supporting constructive public-private collaboration on urgent and fundamental reform of education systems and education policies to prepare workforces for the jobs of future through department-specific programs keeping in view the global and regional exchanges of best practices and global business commitments. It will not be necessary to reinvent the wheel, as a number of global and local success stories abound in creating such network of public-private task forces in India, South Africa, Argentina and Oman, in addition to several private companies pledging to reskill or upskill 17 million workers globally, exceeding the 2018 goal to help 10 million workers by 2020.

Policy Direction 2

Uttarakhand should create a joint platform such as **State Education Sector Reform Council** to forge an alliance to incorporate the new / potential Industry 4.0 skills for today's enrolled students as well as designing a sustainable "foundation" of skill-education that will run across disciplines for the future. The universities, institutions and even different department within an institution should jointly rejig the curriculum, course content to incorporate those futuristic skills. Traditional watertight boundaries should be eased to learn from each other how, say, the Computer Science department can help the English Language and Literature departments to help graduates who will be able to work as 'web content writers' with skills in search engine optimisation.

At present, the higher education system in Uttarakhand is mainly focused on traditional mainstream subjects offering Masters, MPhil, and Doctorate degrees. Whereas a graduate is expected to have a degree as an entry qualification, the job markets have their own demands and special needs. Gone are the days when a "proficient in computers, MS Office" remark in the resume would have attracted potential employer. At present they look for specific skills such as social media marketing or advance office applications. Then, there are language (English) needs that is a big challenge among the graduates from rural areas and even sub-urban colleges. Open University system was expected to address the life-long learning needs and special training in professional courses, but they also became a 'degree granting' institutions with little or zero value addition for a self-learning adult pupil. If we need to transform the education sector according to the needs of the job markets, it is also imperative that we take into account the specific skillsets that can be added to the mainstream subject groups. For example, given how election campaigns are being handled by professional agencies, can we produce such MA (Political Science) graduates who can handle demographic data and conduct voter surveys professionally? Market research jobs are now highly segmented; the burden of job requirements for a specific set of purposes and skills gap trends will likely create a niche area within the traditional mainstream subjects. These and many other new sources of job creation have to be identified through a partnership with major recruitment agencies and then provide a unique opportunity to our students to opt for such value-added training while completing their regular degrees. Leapfrogging to job oriented reform of traditional higher or technical education requires proactive measures from institutions and governments to ensure our students can identify early on, the highest-growth occupations and most in-demand skillsets.

Closing the Skills Gap

Closing the skills gap among educated youths could add to the socio-economic development of the State. Prevalent higher education and training systems need to keep pace with the new demands of labour markets that are

continually challenged by technological disruption, demographic change and the evolving nature of work. State governments across the country are under increasing pressure to find solutions, including by involving the private sector in areas where changes are required. Few governments, however, are able to act rapidly and collaborate with private sector actors to reform education and training systems. On the other hand, businesses are initiating their own programmes aimed at skilling, upskilling and reskilling their workforces (and more broadly, communities), although few are able to effect systemic change alone. Drawing on the insights that we have developed through the *Future of Jobs Report (2018)*, the Government should partner with the industry (especially those based in Uttarakhand) and identify resources like CSR Funds to accelerate the closing of skills gaps in higher and technical institutes in the State. In doing so, the Government might as well identify a few potential areas of reform such as:

1. Inclusion of upskilling with the ongoing programmes.
2. Enhancing the future - readiness and employability of regular graduates.
3. Innovative skills funding models (through CSR, co-financing)
4. Skills anticipation and job market insight in collaboration with professional recruitment agencies.

Policy Direction 3

Government should partner with the industry (especially those based in Uttarakhand) and identify resources like CSR Funds and develop innovative models such as co-financing with employer groups, to accelerate the closing of skills gaps in higher and technical institutes in the State. Each higher and technical education institution in the State should identify subjects, courses and a parallel set of "Skills Gap Accelerators" and aim to

utilise the public-private collaboration platforms to address skills gaps and to reshape education and training for the future. The accelerator model drives systems change, highlighting the need for collaborative action across different scales – not just institutional structures and policies but also norms, attitudes and through individual business commitments

To launch Closing the Skill Gap exercises, the accelerator model should bring together public and private sector leaders, generally Ministers and CEO's, to generate local insight, develop local needs-based action plans and drive their execution. Each institutional accelerator along with champion countries are part of a global platform, to enable the acceleration of learning through the exchange of insights and experience. A State-wide specialised training programme should be launched to identify institutional 'champions' who will drive the skilling initiatives with their respective institutions and in turn, would be rewarded suitably through social recognition from the State. In order to successfully implement the upskilling or reskilling of the regular graduates, a standard operating guide for stakeholders should be developed through a joint consultative process with all the stakeholders. Such a guide will provide the individual trainers, faculty and educational administrators with tools, knowledge resources and processes for action to close skills gaps and prepare for the *Future of Work*. It will be a living document which is continuously updated with the learnings from the ongoing processes and the work done by the parties involved.

Policy Direction 4

State should identify individual skilling champions in each of the institutions, train them and provide them with tools, knowledge resources and action plans (processes) to initiate Skills Gap Accelerators within the mainstream departments of their institutions. In doing so, successful 'champions' should be rewarded through social recognitions (Awards/incentives etc.) by the government in a suitable way.

Development of Futuristic Human Capital

The World Bank defines human capital as a synergic combination of the knowledge, skills and health that people enjoy over their lifetimes with opportunities to use their potential as productive members of society. Without human capital, societies cannot sustain economic growth, a productive workforce and cannot compete effectively in the global economic scenario. The economic liberalisation of the last era, more specifically Globalisation 3.0, has raised many a discordant note that pointed at the widening disparity in benefiting from the economic growth and global economic integration. While economic progress and poverty reduction were at the forefront of showcasing the results of globalisation, inequality and economic security also attracted widespread criticism in many countries. The impact of the liberalisation on domestic human capital has not been highlighted as prominently as those other areas of economic growth. Industry 4.0 is going to pose more challenges to governments in populous countries like India as technological disruptions are bound to impact on the local workforce and consequent unemployment scenario. The *Future of Jobs Report 2018* of the World Economic Forum indicated that while 75 million jobs are expected to disappear in the next five years, another 133 million new kinds of jobs are expected to be created across the developed and emerging economies. Even if we ignore these figures hinting at some methodological issues and assumptions, what is clear from the emerging scenario is that the added challenge for the education and training sectors in coming years will be not only to produce skilled manpower but to provide ample opportunities for existing employees to reskill themselves in order to retain their present jobs.

Continuing, open and distance education was late to pick up speed in India largely due to the initial hesitation to accept these modes of education at par with the traditional classroom-based programmes. It took decades to establish the State open universities and promote open schools as a major pillar of the education sector in the country. With the changing nature of works and demands for continuous up-gradation of skills in the industry, these open universities have to play a more aggressive role in providing lifelong education opportunities to those who want to upskill or reskill at their own will, pace and space.

Many existing jobs will change in their roles and functions substantially over the next decade due to technological impact in the industry. It will put pressure on the existing workforce to open up for major role adjustment. Many of the existing workers will need months of additional training and knowledge up-gradation to function properly in their present position. Imagine the tribe of accountants who would soon need to opt for online real-time accounting and Enterprise Resource Planning (ERP) systems. Is our open and distance education sector ready to provide those additional learning and training requirements? If our education sector and policy-makers fail to support the workers to attain and upgrade skills, the outcome could lead to under-productivity, talent shortages, further unemployment due to retrenchment and layoffs. Open university and its study centres have to play an active role in not only roll out of new job-related skill up-gradation programmes but also tie-up with public and private sectors to provide more role and function-specific courses rather than only those mainstream certificate, diploma or degree programmes.

Policy Direction 5

State Open University and its study centres should reorient its regular programmes and include the new skill and knowledge based programmes for the existing workforce as many of them would need further training to retain their jobs. In line with the central government's SWAYAM initiative, the State universities and institutions should also create new and locale-specific massive open online course (MOOC) platforms to leverage the increasing affordability and penetration of Internet connectivity even in rural areas.

In tandem with the open and distance education system, the higher and technical education sector in the State should start exploring the massive open online course (MOOC) platforms to be created at the State level, focusing on local needs. MOOC is an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials, such as filmed lectures, readings, and problem sets, many MOOCs provide interactive courses with user forums to support community interactions among students, professors, and teaching assistants (TAs), as well as immediate feedback to quick quizzes and assignments. MOOCs are a recent and widely researched development in distance education, first introduced in 2006 and emerged as a popular mode of learning in 2012. The higher and technical education institutions in the State need to take up the MOOC in a big way to support the regular mainstream programmes and may very well help to decrease the skill-gap highlighted earlier. It may be noted that the Government of India has already launched a MOOC platform called SWAYAM that is designed to achieve the three cardinal principles of India's Education Policy: access, equity and quality. Since its beta launch in July 2017, the platform has enrolled over 10 million learners. At the rate it's growing, in a few years, SWAYAM could become the world's largest MOOC provider, offering courses in a wide variety of disciplines from prestigious Indian institutions such as IITs and Central Universities. The intended transformations in the way in which open and distance education systems, institutions and programmes work needs a change focusing on their materials production techniques, technology for dissemination and business models drawing on diverse pools of talent and specialised skills from around the country.

The education system has been following a teacher-centric approach. This is the time to move from teacher-centric physical classroom to student-centric digital teaching and learning approach. They are more interactive, visually rich, personalized and hands-on. It is an opportunity to nurture and develop self-learning behavior in the students. This will broaden their thinking, stimulate curiosity and cultivate a higher level of interest. The journey of digital education in India and Uttarakhand is bound to take a huge leap in the coming years as many have realized the need for digital as an enabler for better education. Though there could be a few roadblocks in terms of mindset change, resistance to changing age-old teaching and learning practices. However, it is expected that things will change quickly change as academicians, technologists and industries work together to create a strong digital ecosystem for education. Affordable access to the internet and huge smart-phone penetration will support this movement.

The appetite from students for online offerings will likely grow because of COVID-19. Even before the pandemic, many universities were seeing declines in enrolment for campus-based programmes and parallel increases in uptake of their online courses. With new normal, it can easily oveserved that how yesterday's disruptors can become today's lifeguards. While traditional institutions once viewed online education as a threat, it has come to their rescue.

Policy Direction 6

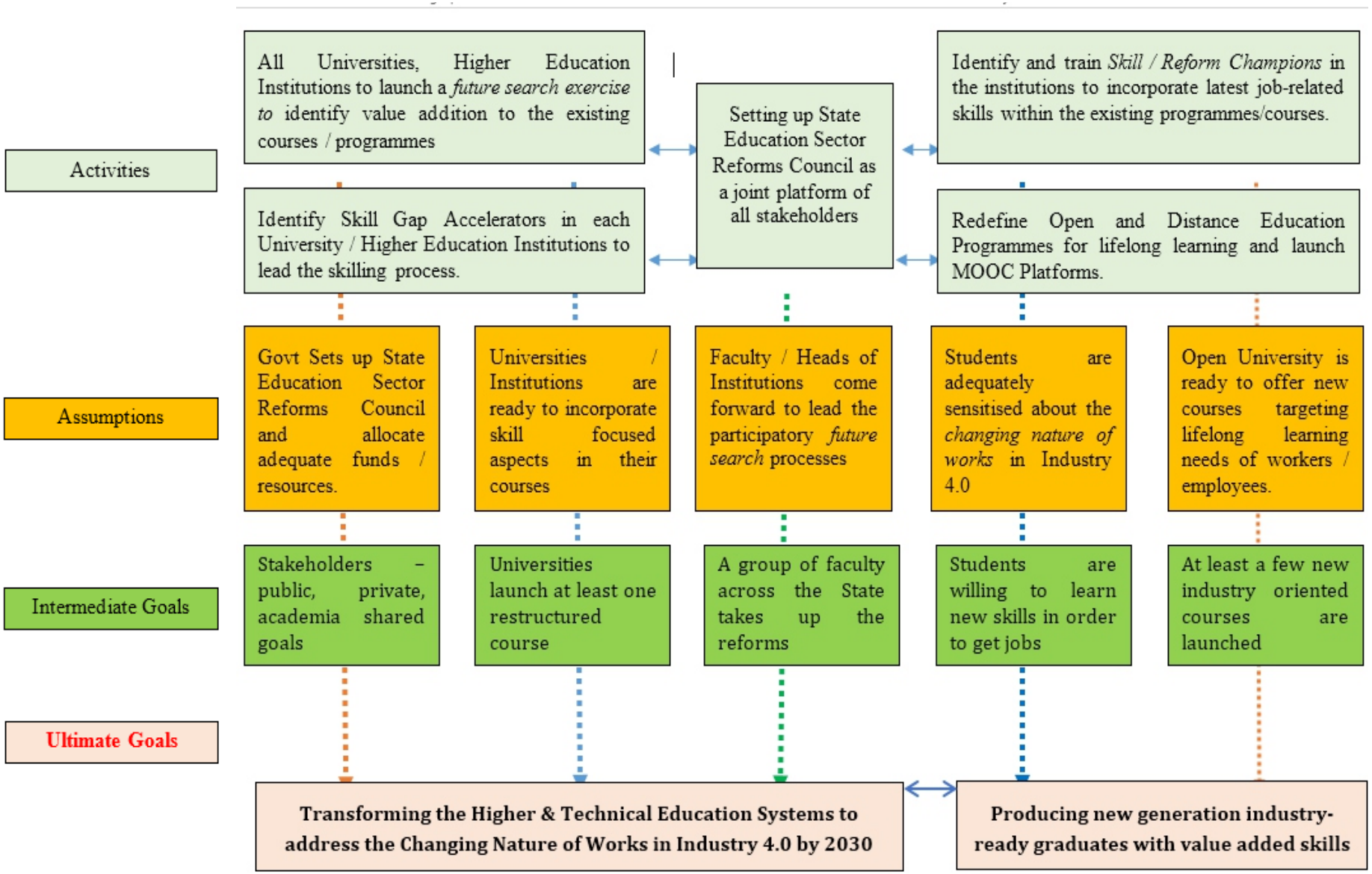
The State government must consider a comprehensive policy framework for on-line teaching – learning ecosystem for education sector that may include (i) taxonomy of online education, (ii) teaching-learning management, (iii) assessment and evaluation. Online education platforms such as Coursera, an International Finance Cooperation (IFC) client with a global presence, can play a meaningful role by tapping their expertise in online programme design, choice of tech platform, and digital marketing to develop the best content either with or for the traditional players. For bringing uniformity and equity, the government must provide better internet, and other required infrastructure and policy directions. The current opportunity may be used for improving the education base with lower cost.

Theory of Change

Policy researchers across the world are increasingly using a Theory of Change (ToC) framework to support any policy recommendation in order to indicate a roadmap towards implementing the suggested changes in an existing system. It has become a popular methodology among development actors for planning, participation, and evaluation of any programme to promote desired systemic or social change. Theory of Change defines long-term goals and then maps backwards to identify necessary preconditions. In other words, the Theory of Change explains the process of change by outlining causal linkages in an initiative, i.e., its shorter-term, intermediate, and longer-term outcomes. The identified changes are mapped – as the "outcomes pathway" – showing each outcome in logical relationship to all the others, as well as chronological flow. The links between outcomes are explained by "rationales" or statements of why one outcome is thought to be a prerequisite for another.

The policy directions suggested in this chapter are now presented through a Theory of Change framework in order to - 1) project a possible scenario of desired and actual outcomes and (2) provide the relevant stakeholders with a model of their long term goals before they decide on actual form of intervention and activities to achieve those goals. Having envisioned a working model of desired changes in the policies, the implementers can make more informed decisions about specific strategies at the grassroots level. Based on periodic monitoring and evaluation data, the Government (and other stakeholders like universities, institutions) can later modify the Theory of Change.

EDUCATION SECTOR REFORM: THEORY OF CHANGE



Indicative Action Plan

Prof Srikant Datar and others in their seminal study long ago alerted us about the rapidly changing work environments and how even reputed business schools and MBA programs were finding it difficult to survive the onslaught of increasingly complex organizations and competitive careers. That situation that they predicted more than a decade ago is now lurking at our doors. Our higher and technical education system as a whole is at a crossroads at which we have to reconsider the complete system, its educational programmes and their value proposition for the students. Uttarakhand should now take a broader view of their responsibilities and negotiate with multiple stakeholders – universities, institutions, education departments and agencies and find out a way to offer our students with "a deeper understanding of such phenomena as globalization, leadership, and innovation, as well as the ability to think critically, decide wisely, communicate clearly, and implement effectively" (Datar, et al, 2010). The main purpose of this section is to offer an indicative "action plan" for the State taking an overview of the arguments presented in this review. However, a unified vision and collective action facilitated by the Government of Uttarakhand toward a common purpose is needed to respond to the challenges faced by the higher and technical education sector in the State today.

Redefining Higher & Technical Education

Uttarakhand will embark upon a mission to redefine its higher and technical education system to offer an education and training environment that has the power to transform lives - the transformation begins with the individual, and moves outward: to family, to community, to society. It will focus not only on individual growth but also derive social and economic benefits in the form of self-confident and dynamic teacher-student communities which foster social stability, independence, creativity and entrepreneurial endeavours.

The key to initiating this transformation will be to bring all the stakeholders together to a State-wide consultative *future-search* process to motivate them to share a common agenda for the delivery of a quality learning experience that challenges each student to realise their potential, to raise their aspirations and to achieve their personal ambitions. Teachers, students and educational administrators should come together to rebuild, reshape and redefine a new education and training system which empowers learners to be confident in their national, cultural and individual identity, to be aware of their capability to achieve more and to take every opportunity that arises to be the best that they can be. In order to do so, the universities, colleges, departments, institutions at all levels should redesign their existing courses and programmes to offer a wide range of futuristic learning opportunities and experiences, reaching out to all learners – including those impacted by geographical, economic and social disadvantages, learners who need additional educational support and learners who wish to enhance their skills. The State shall set out to deliver a learning experience to the working education practitioners as well as the industry, of the highest international standards, to support the development of institutional capabilities to drive continuous improvement and reform across education and training.

The Education Department's work will reflect the value that the Government places on education in order to provide an education and training system, based on evidence-informed policies, that is designed to anticipate and respond to the changing needs of learners, society and the economy.

GOAL 1	Uttarakhand will redefine a responsive higher and technical education and training system that meets the needs of the future workplaces and raises the aspirations of all learners
GOAL 2	Uttarakhand will advance the progress of learners at a disadvantage and learners with special educational needs in order to support them to achieve their potential.
GOAL 3	Uttarakhand will equip our educational institutions with the educa tional planning skills and support to provide a quality learning experience in a new range of courses.
GOAL 4	Uttarakhand will intensify the relationships between education and the wider community, society, industry and the economy at the local and natio nal levels.
GOAL 5	Uttarakhand Government will lead in the delivery of strategic direction and supportive systems in partnership with key stakeholders in education and training to help each institution to assess its capacities and set its own targets.

Action Plan

GOAL	ACTION NO	ACTIONS/SUB-ACTIONS	TIME FRAME	ACTORS
1	**1.1.**	Form a State Higher Education Reform Commission / Task Force (**HERC**)	6 Months	Government, Universities, IIM, IIT, NIT
	1.2	Complete the drafting of a consent framework for deployment by the higher / technical education institutions	1 Year	HERC, Universities, IIM, IIT, NIT
	1.3	Support institutions on the implementation of the reform strategy	1 Year	Government, HERC, Universities, IIM, IIT, NIT
	1.4	Publish a report on the proposed reforms and new directions in higher / technical education institutions	3 Months	Government, HERC
2	**2.1**	Develop a monitoring and evaluation framework to generate data on resource allocation, to ensure that strategic plans/inputs are linked to outputs and outcomes and to share knowledge and successful initiatives to support better practice across the institutions	6 Months	HERC, Universities, IIM, IIT, NIT
	2.2	Develop guidelines for universities / Institutions to support successful transitions in various stages of the education spectrum to facilitate an integrated model of access from UG to PG and Doctoral levels	6 Months	HERC, Universities, IIM, IIT, NIT

3	**3.1**	Commence the roll-out in universities/institutions of an action plan in the implementation of job market-based contents within existing programmes, to help reduce the gap in 'Degree' achievement and 'employability'.	1 Year (pilot)	HERC, Universities
	3.2	Implementation of an education system redesigning Model to deliver the right supports at the right time to the faculty, administrators and students with additional capacity building and training.	1 Year (Pilot)	All Universities / Institutions
	3.3	Manage interventions in poorly performing institutions through developing a guide to good practice on 's elf-motivated' curricular evaluations.	1 Year (Pilot)	Government, Education Dept, Relevant Universities, Institutions
4	**4.1**	Consult with relevant stakeholders - Industry / SMEs on the detail of curriculum contents required for the redesigning of Higher an d Technical education education -training systems in the State.	1 Year	HERC, All Universities, Institutions, Industry, SMEs
	4.2	Support a state -wide "Skills for Growth" campaign in partnership with universities and institutions to make it easier for them to identify their future skill needs with a view to ensure that the higher and further education systems meet the skills needs of students, the economy, and society.	1 Year	Government, HERC, Universities, Institutions,
5	**5.1**	Conduct a review of the enti re *"Redefining Higher & Technical Education in Uttarakhand"* mission. It will include *a* cost-benefit analysis of 'professionalisation' of the existing systems, contents and processes, in consultation with relevant stakeholders, and to include an assessment of how best to improve the impact on the State's economy from the education sector.	Annual	Government, HERC, Universities, Institutions, Industry, NGOs, SMEs
	5.2	Produce a report which assesses the degree of balance in the higher and technical education system in Uttarakhand, considers how that impacts on skills needs and future capability, and sets out a roadmap of measures, where appropriate, to develop and maintain an optimal ecosystem.	Annual	Government, HERC, Universities, Institutions, Industry, NGOs, SMEs

PLAN FOR HUMAN CAPITAL DEVELOPMENT

Uttarakhand has a substantial size of young population and considering this as a demographic dividend, the state can utilise this as an opportunity to adopt a sate human capital development plan for the next five years. In order to do so the state should adopt the following short and long-term strategies to strengthen the state's human capital development to compete successfully in the local, regional as well as global markets. In order to implement the strategies, the Directorate of Training & Employment, Uttarakhand should develop a detailed masterplan based on latest data and in consultation with other line departments like Labour and Education. The strategies will *inter alia* include the following specially focussing on those who are already out of the education system and presently fall within the broad category of ***educated/uneducated unemployed youths:***

- Special Interventions for education, employment, training and development focused on managerial, technical and professional areas in all sectors of the economy;
- A mechanism for tooling, re-skilling and lifelong learning to cater for changes in the labour market;
- Integration of Processes for "Human Capital Development" impact assessment in the education and training sector;
- Focus on demand-related issues and reform to training practices on real-time basis.
- Develop a single - window service delivery portal for the skill development of the youths through aggregation of free Massive Open Online Courses (MOOC) in local languages through dubbing for enhancing skills of existing workforce in a large scale.

It should be noted that weak links between industry and education system remain a major weakness of the labour market. Engaging industry early on in skills forecasting is essential to ensure the proactive development of the labour force. A close and active collaboration of the state with the industry bodies, chambers of commerce will help the state a lot to implement the strategies listed above.

ILLUSTRATIVE MODEL PROGRAMME FOR EMPLOYMENT

Uttarakhand may undertake a special initiative to support four or five state-operated model human capital development cum employment generation projects designed to improve employability for youths. These projects may be operationalised at identified locations with the District Industries Centres (DICs) as lead agencies who will rope in other educational and training institutions of the area. With highly trained instructors drawing from reputed private sector HR firms who have the latest know-how of the industry and its demands. While engaging these HR practitioners the government may adopt a Pay-for-Success model as lucrative funding/remuneration mechanisms for helping the youths' transition into the workforce, under the assumption that such successful intervention would reduce state spending on future unemployment-related support services/benefits. An important intended outcome of the initiative will be to make youths aware of existing services they could utilise. Successful outcomes of the model projects will be measured in terms of positive educational and employment outcomes for youths. Ethnic, geographic, and socioeconomic factors may also contribute to variability in outcomes within and among the model programmes. When the pilot model project data are available, there will be a need for future policy direction to scale up the intervention to cover all the districts of the state.

Conclusion

Education and training change the future of people. They provide a way to help our youths to realise their full potential, to lead richer lives, and to help our society develop. They can be truly transformative if we properly empower our institutions and people through learning and helping them to achieve their full potential. This entails using education and training services in a flexible, adaptive and innovative way, so as to prepare people for the future workplaces. It needs a *MISSION* to build on our progress so far and looking at what we need to do next, in order to serve the best needs of learners and society and linking in with other national agenda such as the Rashtriya Uchattar Shiksha Abhiyan and the (draft) New Education Policy, 2019.

Uttarakhand India has seen substantial growth in the higher and technical education sector with a steady rise in the number of institutions and enrolment. But, now the new set of challenges that emerges includes - low employability, quality of teaching, educational planning at the institutional/local levels and a strategic reform of the sector. A new strategic action plan is necessary to respond to the '*changing nature of works'* (2019)that will address the capacity-gap of the institutions with respect to students as well faculty, administration to move the State towards a global standard in competitive education that will churn out 'employable' graduates. The gaps in available seats and enrolment, graduation and placement indicate that time is already overdue for such an overhauling exercise.

At the face of any review and policy recommendations, we must still ask ourselves about what we can achieve. The indicative Action Plan given here may provide a fair roadmap for the future. By following it in a unified way, we can make great progress in enhancing our instructional and individual learners' potential by enabling them to thrive. We can improve our society, our local economy and our national contributions. Uttarakhand can surely achieve this by working together.

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7.2 Uttarakhand Health – Required A Paradigm Shift

Abstract

State's Vision of its residents' health is to ensure good health and well being of all citizens of the State by attaining robust child and maternal health, reduction or elimination of communicable and non- communicable diseases as well as expansion of healthcare services, by 2030.

Since its inception in November 2000, the State has made considerable progress on the health front. The State has performed well in terms of several health indicators, and stands in a better position than the national average, while in other indicators, it lags behind. Uttarakhand's broad health indicators like, birth, death, infant mortality rates and maternal mortality ratio have improved remarkably while other key indicators including access to primary and secondary medical care, ante-natal care, immunization coverage, anaemia and malnutrition, continue to lag behind. In recent years, the State has witnessed a surge in some communicable (Tuberculosis) and non-communicable diseases (diabetes, HIV/AIDS, hyper-tension), attributable to life style changes.

There are several challenges faced by the State that hinder progress in its endeavour to achieve it's health vision. Some challenges such as the State's topography, scattered habitations and lack of all weather roads are inherent and difficult to be addressed.

The State has struggled to deploy medical doctors in its health facilities, which have been facing chronic shortages since the inception of the State. The State needs to adopt alternative strategies in light of its past two decades of experience to cater to the medical care needs of its population, especially in hilly and remote areas. One of the strategies could be to promote good preventive health care and health seeking practices, thus reducing the disease burden and resulting in well-being and better quality of life for the people. This will allow the State to redeploy resources to cater to more serious ailments and procedures.

Some transformational strategies, which need to be deployed in concert, are proposed below with the intention to foster debate followed by strong and concerted action in mission mode.

Social Behavioural Change Communication (SBCC) - The Central Strategy

Other challenges such as lack of access to good quality medical care, gaps in medical personnel in hill districts, poor immunisation coverage, malnutrition, emerging communicable and non communicable diseases can successfully be addressed by recognising the limitations faced by the State since inception and undergoing *a paradigm shift in approach from being supply driven to demand driven, putting in place policies and strategies, which make* ***household level behavioural change,*** *in terms of child bearing and child rearing practices and good health seeking practices,* ***as the core strategy;*** *redeploying government health functionariesas counsellors and agents of behavioural change in addition to their regular medical duties. They can be supported under a comprehensive social behavioural change communication strategy, which mobilises communities and promote adoption of good health seeking.*

Revisit the State Health Policy 2002

The State Health and Family Welfare Policy 2002 needs to be revamped based on the experience of previous two decades, recognising the current realities and limitations, it should reflect the emerging healthcare needs of the State's residents including management of health disasters such as COVID-19, and devise cogent strategies to address the same effectively, taking on board relevant national and international best practices.

Revamped Health Policy would require devising of effective strategies and a

transformation in the way the entire health department visualises it's role, from essentially being an organisation almost entirely focussed on preventive and curative medical services, to a force that works in concert to reduce morbidity, maintains good health and well being of citizens, deploys all available systems of medicine in synergistic manner, supports good child bearing and rearing practices, encourages early recognition of illness by its residents, promotes good health seeking practices, invests in reskilling and multi-skilling its health functionaries and uses technology for timely diagnosis and treatment.

Quality of Healthcare – Renewed Focus And Change of Approach Required

The State Health Department has made several strong strides to improve the quality of health care services, especially in district hospitals and community health centres. The Department has entered into several partnership arrangements with private health care providers to manage some of the district hospitals, CHCs and mobile medical units under public private partnership agreements. These are being closely monitored in terms of quality of services and range of services available to citizens.

Several district hospitals are aspiring to achieve high quality service delivery standards and obtain NABH accreditation. Dedicated teams of hospital quality experts statewide are implementing LaQshya and Kayakalp programmes. The State is in the process of developing capacities of its entire health facility staff in management of bio-medical waste. Orientation and capacity development sessions are under implementation in state hospitals and CHCs, where in addition to hospital staff, health functionaries of PHCs and SHCs would also be trained to comply with bio-medical waste management rules, thus making the State fully compliant. A web application and a mobile application have been developed to provide interactive knowledge resources within the reach of every health facility staff through these applications installed on their mobile phones. Despite all the action on quality front briefly outlined above, the State Heath Policy lacks mention of quality of health care services. This needs to change with clear policy statement on what is the State Vision on Quality of Health Care Services and what strategies does the State intend to adopt to establish **quality of care as a core** value in all its health care facilities. This requires a culture change within the health care facility staff of each facility. This is best done on-site and whole site, by teams of dedicated professionals, **Quality Champions** in each health care facility, who do not limit their support to documentation and inputs to achieve prescribed quality parameters for certification purposes. Instead the hospital teams should work towards team cohesiveness and team pride in improving quality of services in all aspects of hospital services with focus on outcomes for patients and patient satisfaction.

Deploying Technology – Bringing Medical Care Closer to People

In order to bring good quality healthcare services closer to the people in the State, keeping in view the scattered and remote locations of villages, especially in the hill districts and well aware of the long continuing challenge of attracting medical personnel to work in the hill districts (the State has one of the lowest doctor population ratios), it is an urgent need to devise innovative strategies to fill the wide gap in access of citizens to health care services. One of the tested and widely available solutions is telehealth (which term used here includes all its sub-branches such as tele-radiology, tele-obstetrics, tele paediatrics etc.). These technologies are readily available at reasonable cost and can be quickly deployed with reskilling of frontline health care workers connected to specialist hubs at district/State/National level to provide guidance, support and referral, without the patients having to struggle to find a health facility which can cater to their needs for medical attention. The experience of tele-health in some pockets of the State needs to be rolled out to cover the entire State.

Making Health Functionaries More Effective – Reskilling & Supportive Supervision

In order to achieve the challenging targets of Uttarakhand Vision 2030, it is necessary to optimally utilise the available heath care staff and functionaries. This can be achieved in two ways.

One would be to reskill, multi skill and enable them to cater to the changing health care needs of the population, such as non-communicable diseases, mental health and geriatric care and emerging communicable diseases such as COVID-19. Increasing use of high quality standard treatment guidelines and support through tele-health technologies can make them many more times effective than at present. Multi-skilling would have a beneficial impact of boosting their sense of pride in newly acquired proficiency and enable them to stand out amongst their peers.

Second part of this strategy entails bringing in higher levels of accountability in the functioning and performance of the health care facility staff by establishing well defined roles and responsibilities, setting annual performance targets and defining clear and measurable performance indicators. This coupled with regular and objective performance appraisal would establish a culture of accountability to outcomes. Higher performance should result in some form of rewards.

Greater use of technology to support performance of frontline staff such as ANMs in real time would also bring in an added benefit of closer monitoring of their key functions such as ANC services, immunization, counselling families and supporting behavioural changes at household levels.

Ayurveda, Yoga, Unani, Sidha and Homoeopathy (AYUSH) Systems – Harnessing Their Well Being Potential

The State has a vast network of health care facilities and personnel of Ayurveda, Yoga, Unani and Homoeopathy systems of medicine. People in the State rely on healthcare services provided by 19 Ayurvedic, Unani and Homoeopathy college hospitals, 8 Ayurvedic hospitals and 659 dispensaries of these three systems of medicine, other than 362 Yoga centres, schools and ashrams. Ayurveda and Homoeopathy doctors provide services in several district hospitals, CHCs and PHCs of the State and there are 647 Ayurveda and Homoeopathy wings in these government health facilities.

Uttarakhand has acquired the distinction of being the Yoga capital of the World and students and practitioners from within the country and from several countries enrol to learn and practice this system of well-being. This position must be leveraged to expand the number of centres at carefully identified locations all across the State, improve quality of facilities in these centres, enhance the skills of Yoga teachers and the services provided in these centres, to attract a growing number of students and clients. The State has announced AYUSH Policy 2018, whereby it intends to facilitate integrated programmes on management and prevention of lifestyle diseases though public health activities, propagate science of healthy living; manage wellness centres under NHM; develop AYUSH township, promote AYUSH Grams as centres of wellness and rejuvenation; encourage Yoga Grams and Centres to be established as state-of-the-art Yoga and meditation centres and foster AYUSH Wellness Resorts. *An empowered task force needs to provide the stewardship to realise these policy intentions.*

Convergence of AYUSH and Health & Family Welfare Departments to jointly promote prevention, good health and wellbeing amongst the people should be the way forward.

.The two departments must strategize and plan together, and pool resources to bring about improved health maintenance and health seeking practices amongst families. This would result in building an environment of safeguarding good health, good nutrition practices, improved care and hygiene practices, early recognition of illness

symptoms, seeking of timely diagnosis and appropriate treatment by professionals, leading to marked reduction in morbidity and all-round good health.

Preparedness for Medical Disasters/ Pandemics

The State requires preparing a comprehensive disaster preparedness and management plan to successfully tackle COVID-19 like pandemics and other adverse health events, food poisoning incidents, natural calamities, landslides and accidents. The health disaster preparedness plan would include acquisition of necessary equipment and their assessed need based distribution in all districts, stockpiling of essential supplies, medicines, personal protective equipment, testing facilities, preparation and dissemination of standard operating procedures and standard treatment and safety guidelines, training of all health personnel and rapid deployment of isolation areas for prompt and effective management of pandemics and treatment of communicable diseases of unknown nature, while safeguarding themselves and isolating the infected patients.

Use of technology must be made to the fullest extent possible, to instantly communicate with all health personnel, calling them to the frontlines, training health personnel in standard operating procedures related to management of any adverse event and for concurrent monitoring, should become an integral part of the health disaster preparedness plan.

A. Health Infrastructure Gaps, Chronic Shortages of Doctors and Paramedics

Access to health care in hilly, rural parts of mountain districts is lacking, largely due to poor infrastructure and connectivity (communication, roads, including internet etc.). Given these limitations and small/ scattered nature of rural settlements, improving access to healthcare poses a major challenge. Shortage of qualified health functionaries is also a critical and persistent gap.

Though the network of sub centres in the State has expanded, gaps in other health infrastructure persist. Uttarakhand Vision 2030 states that there are 2.58 Primary Health Centres available for a population of one lakh, which is half of the national norm of 5/lakh population.

Table 7.2.1 No. Government Health Facilities

Institution	As on 2002*	As on 2019#	As per IPHS Norms
District/Base/ Combined/SDH Hospitals	33	42	-
CHCs	26	81	104
APHCs / BPHCs	(232) 171/ 61	250	417
Sub Centres	1525	1881	-

Source: Directorate of Health Services, Uttarakhand

Shortage of Workforce

Shortage of doctors in Government service is the State continues to persist as efforts to attract and retain physicians in hill districts are not very successful. W.H.O. prescribes doctor population ratio of 1:1000. In India the doctor-population ratio is 0.62:1000 (allopathic doctors) implying there's one doctor serving almost 1,613 people. At present total strength of allopathic doctors in Uttarakhand is 1545 out of a total sanctioned 2716 positions, implying that one doctor is available for 6528 people (based on 2011 population). The disparity of doctor-population ratio is worse in hill districts.

Table 7.2.2 Status of Govt. Health Workforce

Status of Health Workforce in Uttarakhand (2019)				
S. N.	Designation	Sanctioned Posts	In Position	% Vacant
1	Medical Specialists	1067	420	61%
2	Medical Officers Grade-1	643	88	86%
3	Medical Officers	2735	1995	27%
4	Nurses	1567	1117	29%
5	Lab/ Other Technicians	515	242	53%
6	Pharmasists	1564	1442	8%
7	ANMs	2270	1713	25%

Source: Directorate of Health Services, Uttarakhand

Another dimension of this issue is shortage of doctors in specialist category, which has been a major cause of failure to upgrade or convert CHCs into FRUs and 24x7 facilities.

B. Trends in Health Indicators and Stumbling Blocks in Achievement of Vision 2030

The Uttarakhand State Health Policy formulated in 2002 revised in 2013 has resulted in considerable progress in terms of several indicators over the years. In some indictors, progress has been slower than desired. Trend of Health Indicators in Uttarakhand from 2005-06 to 2017 is reflected below alongside SDG interim and 2030 targets, reflecting the progress made, and at the same time throwing light on the distance yet to be traversed to reach the destination set out in the Uttarakhand Vision 2030.

Table 7.2.2 IMR and Under 5 Mortality

Indicator	Uttarakhand						
	NFHS 2005-06	NFHS 2015-16	AHS 2012-13	SRS 2002	SRS 2017	2024 Target	2030 Target
Infant Mortality Rate	42	40	40	50	32	29	25
Under 5 Mortality Rate (U5MR)	56	47	48	NA	35	31	25

Sources: NFHS III (2005-2006), NFHS IV (2015-2016); AHS (2012-13); SRS 2002 & 2017; UK VISION 2030

B.1 Infant Mortality Rate (IMR): The State has been successful in reducing the IMR from 50 in 2002 (SRS 2002) to 32 (SRS 2017) in 15 years. The interim 2024 target for IMR is 29 and target for 2030 is 25. The path to reduction of IMR gets more difficult as the IMR is reduced to levels around 30 as this reduction is to a large extent driven till this point through improvement in antenatal and post-natal care, vaccination of infants and colostrum feeding. To bring the IMR from 32 to envisaged 25 requires improving the household level child bearing and rearing practices of families to ensure pregnant women do not suffer from anaemia, they maintain a healthy diet, get adequate rest, gain minimum 10 kg weight and deliver a healthy baby above 2.5 kg; keep the newborn warm and avoid acute respiratory infection due to exposure and needless bathing in the open; the families need the lactating mother to practice colostrum and exclusive breast feeding, maintain breast hygiene and feeding posture; prevent diarrhoea; adhere to prescribed immunization schedule of the infant and ensure timely weaning with semi-solids, providing necessary nutrition as per the needs of a growing infant. *All the above is possible if families realise the rationale for these practices and adopt them. This is easier said than done. Age-old norms and beliefs come in the way of change to new practices and require persistent effort, negotiation,*

persuasion and reaffirmation to support the families as they transition to improved behaviour. This not only requires perseverance but also necessary skills as counsellors. ANMs and ASHAs are our front line force, which if re-skilled carefully and supported by the system, would be effective agents to bring about this change, to not only achieve the desired reduction in IMR but continue to sustain reduction to still lower levels.

B.2 Under 5 Mortality Rate (U5MR): U5MR has reduced from 56 (NFHS 2005-06) to 35 (SRS 2017) in 11 years. The interim 2024 target for U5MR is 31 and target for 2030 is 25. Health status of <5 year old children is to a major extent dependent on the recognition of the nutritional needs of growing children and providing them adequate and healthy food, timely weaning, growth monitoring, prevention of diarrhoea, hygiene practices and timely medical care in the event of illness. Provision of one meal at AWCs or mid day meal in schools does not suffice. Household level child rearing practices need to improve. Such improvements require persistent and diligent follow-up and repeated family counselling, not restricted to mothers or even parents as in Indian households, other family members also need to be roped in to change their practices, which may adversely affect the health of a growing child. *Here again, the ANMs and ASHAs supported by the entire health system and community leaders, could be effective agents to bring about this change to not only achieve the desired reduction in U5MR but a sustained reduction to still lower levels. This needs to be addressed by a sustained and comprehensive social mobilisation strategy.*

B.3 Nutritional Status of Women and Children

Table 7.2.3 Anaemia, Stunting & Malnutrition & Wasting

Indicator	Uttarakhand			
	NFHS 2005-06	NFHS 2015-16	2024 Target	2030 Target
All women age 15-49 years who are anaemic(%)	45.2%	54.7%	19.0%	<10.0%
Children under 5 years who are stunted (height-for-age) %	44.4%	33.5%	12.13%	<5.0%
Children under 5 years who are underweight (weight-for-age) %	38.0%	26.6%	10.4%	<5.0%
Children under 5 years who are wasted (weight-for-height) %	18.8%	19.5%	8.63%	<5.0%

Sources: NFHS III (2005 -2006), NFHS IV (2015 -2016); UK VISION 2030

From the above table it is apparent that in terms of nutritional status of women and children in the State, a herculean challenge is ahead with only 4 years left to achieve interim targets and 10 years to achieve the 2030 Vision targets. While we have indicators from the NFHS–4 survey pertaining to 2015-16, the latest NFHS–5 data is expected to be released later this year, when we would have a better picture of the current status of these indicators. Nevertheless, the gaps between the status in 2015-16 and the interim targets for 2024 are alarmingly large, especially when we see that in 10 years from 2005-06 to 2015-16, anaemia amongst women and wasting amongst children increased instead of decreasing, and we have the challenge of reducing anaemia by

65% amongst women from 54.5% to 19% by 2024 (less than 4 years) and reducing wasting amongst children under 5 years by 56% from 19.5% to 8.63% by 2024. Even to achieve the target of stunting amongst <5year children from 33.5% in 2015-16 to 12.13% in 2024 means reduction of 64%, a tall order indeed.

B.3.1 Persistent Anaemia Amongst Women: It is scientifically established that anaemia amongst pregnant women results in several complications for the women themselves as well as for the newborn and is a major underlying factor responsible for maternal, neonatal and infant deaths.

High prevalence of anaemia amongst women residents of the State has been persistent, having increased between 2005-06 and 2015-16. To bring the prevalence down from 54.7% in 2015-16 to 19.0% by 2024, which is the interim target of the Vision 2030 and further to less than 10% requires concerted efforts, mostly at household level.

Government Health Department has made distribution of Iron and Folic Acid tablets to pregnant women, part of the antenatal care package for decades, without seeing results commensurate with the effort and expense. Weekly Iron and Folic Acid Supplementation (WIFS) for adolescent girls in schools and those out of school, coupled with bi-annual deworming was started in 2012 to address anaemia at an early age. Impact of these measures would be evident in the NFHS-V findings, due later this year. It is hoped that the gap would have closed somewhat in 4 years since 2015-16 survey.

It is clear that unless nutritional practices of families change and they not only become aware of iron rich foods and include these in their regular diet, persistence of anaemia is unlikely to be tackled and brought down to envisaged levels.

To bring about such a change requires a state-wide community mobilisation, converging efforts by frontline health and ICDS functionaries skilled for family counselling, support of the entire health department, active partnerships with associated government departments, advocacy of opinion leaders, active participation of community leaders, NGOs, media, religious leaders, educational institutions and youth organisations. This would require a clear policy direction, a well-designed strategy, and necessary financial allocation. The results of such community mobilisation for change will not only result in sustainable change, reducing morbidity and burden on the health system, improving well being of citizens, but will be highly cost effective too.

B.3.2 Poor Nutritional Status of under 5 Year Children: The first five years of a child's life are fundamentally important. They are the foundation that shapes children's future health, happiness, growth, development and learning achievement at school, in the family and community, and in life in general.

Recent research confirms that the first five years are particularly important for the development of a child's brain, during which period more than 90% brain develops, and the first three years are the most critical in shaping the child's brain architecture. Early experiences provide the base for the brain's organizational development and functioning throughout life. They have a direct impact on how children develop learning skills as well as social and emotional abilities. Poor nutritional status results in impaired development of the brain and suboptimal development of necessary skills and abilities, which have lifetime adverse impact on the individual.

While the government has several schemes to provide nutrition supplements from Aganwadi Centres and mid day meals in schools, these can at best be supplements. Families and caregivers need to recognise the nutritional needs of growing infants and children and provide them with healthy diet while monitoring their growth.

The Health Department functionaries need to closely work with ICDS functionaries to promote widespread knowledge amongst communities, families and care givers on the nutritional needs of infants, timely weaning and diet of growing children, make them

understand how lack of nutrition will cripple their child for life, affecting their ability to be optimally productive and useful to society. Convergent and sustained action by multiple departments acting in concert with opinion and community leaders, NGOs, schools and religious bodies can bring about this change across the State supporting frontline functionaries such as AWWs, AWHs, ANMs and ASHAs who need to be trained as counsellors. Such persistent and regular family counselling and follow-up visits can bring about such change for sustainable impact.

B.4 Breast Feeding and Weaning Practices: Breast feeding and weaning practices have a direct relationship with anaemia, stunting, wasting and malnutrition of infants and under 5 children. Lack of these practices, results in increased risk of diarrhoea and illness amongst infants and <5 children besides adversely affecting their growth and development.

B.4.1 Colostrum feed, that is breast milk fed to a newborn within one hour of birth, provides the newborn with much needed immunity; key nutrients in a concentrated form; it has laxative effect that helps in the first bowel movement in a baby and prevents jaundice by expelling bilirubin from the baby's body; provide a coating in the gastrointestinal tract acting as a barrier that prevents most foreign proteins from penetrating the gut; it has a very high amount of antibodies called 'secretory immunoglobulin A'. Hence, it is considered to be the baby's first immunisation against infections; it is high in cholesterol, and helps in the growth of the baby's nervous system and helps in the overall growth and development of the baby by providing nutrients like zinc, calcium, Vitamins A, B6, B12 and K.

This highly useful practice needs to become universal at the time of every birth in the State, but latest available data from NFHS–4 (2015-16) shows that only 27.8% of newborn in the State were fed colostrum. This needs to improve to 100%, and requires the benefits of colostrum to be explained to families as well as health care staff responsible for deliveries in government institutions, so that it becomes a must do practice.

This would require concerted efforts and prior counselling of family members to wean them away from traditional superstitions and insist that the newborn is fed colostrum by the mother within one hour of birth. The health care facility staff where institutional deliveries take place also need to be reoriented and invariably facilitate colostrum feeding of the newborn. In case of deliveries conducted at home (31.4% as per NFHS-4 in 205-18), the role of family members and the birth attendants is important to ensure colostrum feeding.

B.4.2 The second very concerning issue is **lack of timely weaning** (between 6-8 months) of infants to semi-solid food and followed by solid food. The age-old misbelief that the infant is to be kept on milk till teeth come out, needs to be dispelled through effective and sustained counselling. In 53.3% cases as reported by NFHS-4 (2015-16) caregivers did not wean their infants in a timely manner thereby undermining their growth and development due to sheer ignorance. This stems from lack of understanding of the nutritional requirements of a growing infant and child and providing them with healthy and safe nutrition, coupled with regular growth monitoring.

This gap in knowledge can easily be bridged with good quality counselling and follow up. The State needs to develop the counselling skills of front line health functionaries and make them accountable for regular follow up to ensure that each child receives the required nutrition for optimal growth.

In this case again, the role of social behavioural change communication strategy and need for continued support acquires great importance, till these good practices are well entrenched in the culture of the communities.

Indicator	Uttarakhand		
	NFHS 2005-06	NFHS 2015-16	AHS 2012-13
Children Age 3 years Breastfed Within 1 Hour of Birth	32.9%	27.8%	65.1%
Children Under Age 6 Months Exclusively Breastfed	31.2%	51.0%	37.3%
Children Age 6 -8 Months Receiving Solid/Semi Solid Food & Breast Milk	51.6%	46.7%	10.5%

Sources: NFHS III (2005-2006), NFHS IV (2015-2016); AHS (2012-13

B.5 Family Planning, Antenatal & Post-Natal Care, Institutional Births & Maternal Mortality

NFHS-4 reported that the State in 2015-16 had 53.4% couples using modern family planning methods, which is quite near to the 2024 interim target of 58.82% set in the Vision 2030 document. The supportive programme of the health department should continue in order to the target, which is within reach.

B.5.1 The Total Fertility Rate (TFR) in the State in 2017 as reported by SRS was 1.9, which is below the interim target of 2.1 in 2024 and also final target for 2030 i.e. the State has already over achieved the TFR envisaged for 2030.

B.5.2 Sex ratio at birth as recorded in 2015-16 by NFHS-4 showed a decline from 2005-06, primarily due to higher urbanisation and faster decline of sex ratio in urban areas of the State. NFHS-5 findings will throw light on the current status.

B.5.3 Antenatal Care (ANC): Provision of antenatal care to pregnant women continues to pose a major challenge for the State Health Department. In 2005-06 NFHS-3 reported completion of 3 antenatal visits to 44.8% pregnant women. This percentage fell to 30.9% in 2015-16 of 4 antenatal visits to pregnant women as reported in NFHS-4. The Annual Health Survey report of 2012-13 pegged this percentage at 58.9%. While we wait for the latest results of NFHS-5, it is clear that the State has a long haul to achieve the interim 2024 target of providing comprehensive antenatal care to 83% pregnant women and to 100% pregnant women by 2030. *To achieve these very much achievable targets, there is an urgent need to bring greater accountability to the functioning of frontline health functionaries, and to strengthen supply chains to make available necessary equipment and supplies necessary to deliver the full package of ANC services, accompanied with high quality counselling and timely referral. Use of telemedicine by ANMs to consult doctors and specialists will highly benefit this component of maternal care services and go a long way to reduce maternal mortality by flagging up high risk pregnancies to families and the government medical system, and at the same time would allow adequate and timely preparation at higher level facilities to prevent adverse pregnancy outcomes.*

B.5.4 Institutional Births have shown an improvement by more than doubling in 2015-16 NFHS-4 report, reaching 68.6% from 32.6% in 2005-06. Annual Health Survey (AHS) 2012-13 report also pegs institutional births at 58.3%. The lower percentages reflect the difficulty of women in labour to access delivery centres and well-entrenched traditional preference for home deliveries in the rural communities of the State. The percentage of institutional deliveries is expected to show an increase in NFHS-5 findings when they are made available later this year. *However, to reach the interim target of 92% by 2024 will call for redoubled efforts and strengthening PHCs and sub health*

centres (SHCs), for deliveries where well-trained and equipped medical staff, conduct safe deliveries and provide postnatal care and services to mother and child. Health care personnel involved in deliveries need to be provided skills to prevent death due to asphyxia, which has been reported as a major cause of mortality of the new born in the State). High quality antenatal care and timely identification and referral of high-risk pregnancies to higher level facilities, is an important component of this strategy that needs to be taken care of, while strengthening the PHCs and SHCs to take on higher load of deliveries, thus making these services more accessible.

B.5.5 Post Natal Care (PNC): The package of services under Janani Shishu Surakha Karyakram (JSSK) include 48 hours of stay in the health facility where delivery takes place and provides for medicines, nutrition and care for the newborn and the mother. Transportation costs to the delivery centre and back to home are also met under this scheme.This initiative launched in 2011 is definitely benefiting an increasing number of households and promoting institutional deliveries, as evident from the table above. In 2005-06 only 30.2% mothers received postnatal care services (NFHS-3) in the State and in 10 years this percentage increased to 54.8% (NFHS-4). AHS report pegged PNC at 64.3% in 2012-13 (less than 2 years after launch of JSSK). This scheme is highly useful and requires diligent implementation. *The financial provisions under this scheme need revision to keep pace with costs each year, especially of diet items provided to mothers in the 48-hour stay (in case of normal deliveries) in health facilities after delivery. Strict monitoring is required to ensure that mothers are not discharged prematurely by the health care facility staff due to paucity of funds at their disposal. Care should be taken to provide prompt transportation to delivery centres and back to home. An affordable stay facility (on chargeable basis) in the form of a sarai in the vicinity of the delivery centre requires to be identified for the stay of the family members accompanying pregnant women.*

Indicator	Uttarakhand						
	NFHS 2005-06	NFHS 2015-16	AHS 2012-13	SRS 2002	SRS 2017	2024 Target	2030 Target
Use of Modern Family Planning Methods	55.5%	49.3%	53.4%	NA	NA	58.82	65.96
Total Fertility Rate (TFR)	2.6	2.1	2.1	2.0 (2014)	1.9	2.1	2.1
Sex Ratio At Birth For Children Born in the Last 5 Years	912	888	NA	NA	NA	NA	1000
Institutional Births (%)	32.6%	68.6%	58.3%	NA	NA	92%	100%
Maternal Mortality Rate	NA	NA	165	NA	NA	94	70
Antenatal Care Coverage (4 ANC Visits, 3 ANC VISITS IN NFHS-3	44.8%	30.9%	58.9%	NA	NA	83%	100%
Children Fully Immunized	60.0%	57.7%	79.6%	NA	NA	95%	>95%
Post Natal Care Coverage	30.2%	54.8%	64.3%	NA	NA	89%	100%

Sources: NFHS III (2005-2006), NFHS IV (2015-2016); AHS (2012-13); SRS 2002 & 2017; UK VISION 2030

B.5.6 Maternal Mortality: Annual Health Survey 2012-13 pegs maternal mortality in the State at 165 while the interim 2024 target is 94 (a 43% reduction in 11 years) and 2030 target is 70 (less than half of the 2012-13 level). *These targets are achievable with higher level of skills training of medical and para-medical staff in managing complicated deliveries, preventing mortality due to asphyxia, early identification of high risk pregnancies and timely preparation of delivery centres, medical and para-medical staff to take due care, availability of medicines, supplies and necessary equipment. The LaQshya programme launched in 2018 needs to be strengthened and should redouble efforts to improve the quality culture within the team responsible for deliveries and post-partum care. Strong counselling and inter-personal skills need to be acquired by the delivery teams, who should be encouraged to work in tandem to save lives.*

B.5.7 Immunization of Children: Full immunization of children has been illusive for the State over the years and reflects poorly on the outreach of primary healthcare services. NFHS-3 in 2005-06 recorded full immunization at 60% and reported a fall in 2015-16 to 57.7%. AHS 2012-13 reported full immunization of children to be at 79.6%. Even if we go by AHS figure, there is a significant gap of over 15% as compared to the interim 2024 target of 95%. *Strong supply chain to ensure availability of vaccines and supplies, heightened monitoring and accountability of health staff, transportation support, better coordination with AWWs and ASHAs, use of technology to remind parents for next round of vaccination and stronger follow up of drop-outs similar to the approach adopted in RBSK scheme, is called for.*

B. Health Expenditure

*T*he State plans to increase public spending on Health from 0.79% (2019-20) to 2-3% of GSDP, as stated by the Health Department. The State's allocation for public health in 2019-20 was down 12.22% from 0.9% in 2017-18. Government Health Expenditure was 4.62% of total government expenditure in 2019-20.

The national goal is to achieve the level of 2.5% of GSDP by 2025. In comparison, in 2019-20 Himachal Pradesh has allocated 1.63% of its GSDP for expenditure on health, which is higher than the average expenditure of 18 other States. Kerala has allocated 0.83% of GSDP for health in the same period,

C. Convergence with WCD, ICDS & Other Govt. Departments

There is considerable scope in the State to strengthen convergent action amongst departments of Health, WCD, ICDS, AYUSH, Education, Medical Education, PHE, Panchayati Raj, Rural and Urban Development and Drinking Water, in terms of convergent planning, sharing of resources, databases, opportunities for community interaction, joint reviews and follow up action.

While ICDS programme through the VHNDs organised at AWCs works more closely with the health department, convergent action by the two departments needs to be taken to the next level especially with the implementation of Poshan Abhiyaan. It is in the interest of both to work in tandem as the most worrying indicators of health in the State relate to nutitional practices resulting in under weight, malnourished and stunted children.

ICDS, WCD programmes, Education and Panchayati Raj departments should be able to actively support highly useful outreach activities of the health department such as the Mobile Medical Units Units (MMUs), Janani Shishu Swasthya Karyakram (JSSK) for pregnant mothers *Rashtriya Bal Swasthya Karyakram (RBSK))* (life cycle approach) for children and *Rashtriya Kishore Swasthya Karyakram (RKSK)* for adolescents. Focused interventions like Janani Swasthya Yojana (JSY) promoted institutional deliveries.Policy Direction 1The State should constitute a health policy task force to revisit

the State Health Policy 2002 revised in 2013, in light of the current and future needs of the population, SDG Goals set by the State for 2030, learning from the experience of last two decades, acknowledging the current realities and setting the policy agenda for the next ten years, in consultaton with key staekholders.

Placement of village level functionaries- ASHAs and introduction of transport facilities (Emergency Response Services and Sehat Ki Sawari – Mobile Medical Units) cater to unmet programmatic needs and require active support of functionaries of related departments. Necessary joint orientation of block and village level functionaries and joint review of convergent action based upon progress indicators, would strengthen convergent action in the State leading to rationalisation of expenditure and multifold impact.

Policy Direction 1

The State should constitute a health policy task force to revisit the State Health Policy 2002 revised in 2013, in light of the current and future needs of the population, SDG Goals set by the State for 2030, learning from the experience of last two decades, acknowledging the current realities and setting the policy agenda for the next ten years, in consultaton with key staekholders.

D. Revisit the State Health Policy 2002

The State Health Policy 2002 revised in 2013, has served the State well be providing direction for the expansion of the network of government run health facilities. This policy agenda resulted in improvement of several health indicators such as Child Immunization Coverage, IMR, Institutional Deliveries, MMR, Use of Modern Contraceptive Methods and TFR. This progress was made despite continued shortages of required health functionaries and their disproportionate deployment.

The experience of past two decades, of expanding the network of government health facility network in the State, establishing health systems, carrying out policy development and systemic reforms, implementing several programmes, public private partnerships, may now be put to use to review the current priorities, the changed morbidity patterns, emerging healthcare needs, disaster preparedness and management to meet the challenges of health disasters such as COVID-19, future requirements for achieving the proclaimed targets of Uttarakhand Vision 2030 in response to the SDG Agenda, and the realities of persistent shortages of health facility staff. The State Health Policy should set the policy agenda for the next 10 years, while taking cognisance of the current challenges and devise cogent strategies to address the same effectively, taking on board relevant national and international best practices.

Revamped Health Policy developed in consultation with key stakeholders would require devising of effective strategies and a transformation in the way the entire health department visualises it's role, from essentially being an organisation almost entirely focussed on providing medical services, to a force that also works in concert to reduce morbidity, maintains good health and well being of citizens, deploys all available systems of medicine in synergistic manner, supports good child bearing and rearing practices, encourages early recognition of illness by its residents, promotes good health seeking practices in households, invests in reskilling and multi-skilling its health functionaries and uses technology for timely diagnosis and treatment.

The State Health Policy should provide the framework for a **paradigm shift in approach to public health from being supply driven to demand driven,** supported by a pull on health care services by communities who not only are knowledgeable of measures to maintain their good health and well being but they also adopt good child bearing and rearing

practices, take preventive measures from contracting communicable diseases, recognise illness symptoms and seek timely medical care.

Policy Direction 2

The State should develop carefully crafted and comprehensive social behavioural change communication strategy for the next ten years, as the central public health strategy for sustainable improvement of health and well being of the people. The strategy should be designed to effectively address each stage of behaviour change and each segment of the community, opinion leaders, health care providers, media and functionaries of key stakeholder departments.

E. Social and Behavioural Change Communication – Core Public Health Strategy

Challenges such as lack of access to good quality medical care, gaps in medical personnel in hill districts, poor immunisation coverage, malnutrition, emerging communicable and non communicable diseases can successfully be addressed by recognising the limitations faced by the State since inception.

Expansion of healthcare facilities, positioning of health care personnel, especially doctors and specialists, improving the quality of secondary medical care services through strengthening of infrastructure and medical equipment, increasing provision of medicine and hospital supplies, are not only very expensive but also would take considerable time, going by the experience of past 20 years. While the State has universalised coverage of all residents (23 lakh families) under the Atal Ayushman Uttarakhand Yojana to take care of the financial costs of hospitalisation, providing them medical services in hill districts remains a challenge due to lack of private medical facilities, while several government medical facilities remain under equipped, under staffed and over stretched.

Meanwhile, the people of the State continue to struggle to maintain good health and well being faced with challenges of communicable and non-communicable diseases, natural calamities and pandemics. There is an urgent need to change tack and go through a paradigm shift in approach to public health by enabling people of the State to take care of their own health and well being by transfer of knowledge to communities for safeguarding health and well being and support them through multiple channels including repeated interpersonal counselling to prepare them for seasonal changes, take preventive health measures, adopt good child bearing and rearing practices, recognise symptoms of illness and seek timely medical care, and supporting them through all the transition stages of behaviour change till the good health seeking practices are firmly entrenched and there is trans generational transfer i.e. mother and father transfer these practices to their daughters and sons and share the benefits with fellow residents in villages and towns.

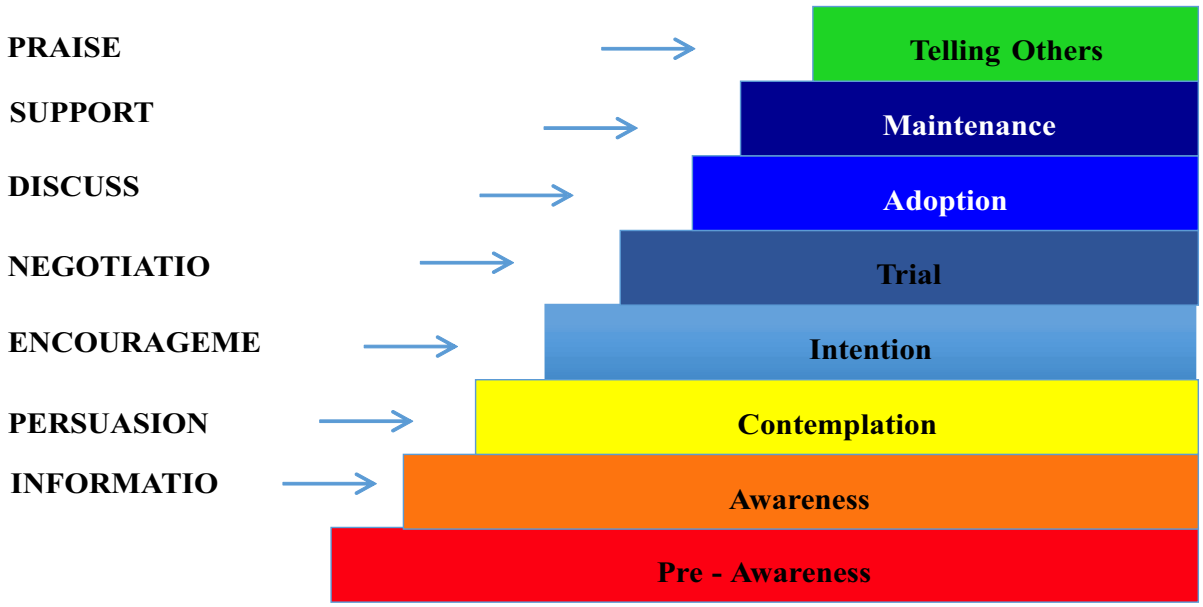
This change in approach makes financial sense as well. The cost of social mobilisation for improved health and well being of the population costs a fraction of the cost of providing medical care while keeping the residents healthy and productive contributing to the State's economy.

The State public health programme needs to undertake a paradigm shift to make **household level behavioural** change, in terms of child bearing and child rearing practices and good health seeking practices, **as the core strategy;** redeploying government health functionaries as counsellors and agents of behavioural change, in addition to their regular medical duties.

A carefully crafted **social and behaviour change communication strategy** needs to be developed and deployed over a sustained period of ten years. This strategy should effectively target various regions, population

segments and stakeholders and support behavioural change over multiple stages of transition, from pre-awareness to inter-generational passing down of the good practices as outlined below:

Figure 7.2: Stages of Behaviour Change



There are various components of a comprehensive social behavioural change communication strategy at the core of which is strong **interpersonal counselling** skills to counsel families, individuals and groups. The existing health and ICDS programme functionaries should be **reskilled to become effective counselling agents** and their work schedule accordingly altered to enable them to carry out this function. Their counselling work should be supported with use of available and low cost technologies to provide high quality audio-visual counselling aids on their mobile phones.

Inter-personal counselling should be supported by community and opinion leaders who need to be brought on board through targeted **advocacy support** generation activities.

Media such as radio, TV and print too play a key role in influencing behaviour, as they bring legitimacy, and should be partnered functionaries is necessary to create a conducive environment for behaviour change.

strategically as effective means to generate media advocacy support, which is more powerful than advertising and at the same time much less expensive. Use of **non-traditional media and social media** to support counselling by front line

Policy Direction 3

Redoubled focus on quality of health services delivered to the people in the State is called for and this should not only be limited to district level hospitals and some community health centres but be extended to services provided by all health functionaries with the help of standard operating procedures and standard treatment guidelines tailored for the State, high quality skilling of the health functionaries to enable them adopt these in their daily service delivery practices. Monitoring of service quality and patient satisfaction should be made in integral part of the service delivery, using available technology.

F. Quality of Healthcare – Renewed Focus and Change of Approach Required

The State needs world class medical facilities, even if they are limited in number, to reassure the residents that they need not converge on Dehradun, Haldwani or travel outside the State in search of quality medical care. All District Level hospitals and community health centres should be upgraded, their staff trained and supported to provide quality healthcare and accredited with NABH or other relevant accreditation systems.

Quality focus should extend to medical services provided through mobile medical units, in health camps, at PHCs, sub-health centres, during vaccination sessions, village health and nutrition days at AWCs, ANC and PNC services and counselling during household visits. Tele-health could be optimally integrated in the service delivery process to improve the quality of care reaching upto sub-health centre and through mobile phones into each household.

The State Health Department has made several strong strides to improve the quality of health care services, especially in district hospitals and community health centres. The Department has entered into several partnership arrangements with private health care providers to manage some of the district hospitals, CHCs and mobile medical units under public private partnership agreements. These are being closely monitored in terms of quality of services and range of services available at all times.

Several district hospitals are aspiring to achieve quality standards and obtain NABH accreditation. LaQshya and Kayakalp programmes are being implemented state-wide, by dedicated teams of hospital quality experts. The State is in the process of developing capacities of its entire health facility staff in management of bio-medical waste. Orientation and capacity development sessions are under implementation in all state hospitals and CHCs where in addition to hospital staff, health functionaries of PHCs and SHCs would also be trained to comply with bio-medical waste management rules, thus making the State fully compliant. A web and a mobile application have been developed to provide interactive knowledge resources within the reach of every health facility staff through these applications installed on their mobile phones.

Despite all the action on quality front briefly mentioned above, the State Heath Policy lacks mention of quality of health care services. This needs to change with clear policy statement on what is the State Vision on Quality of Health Care Services and what strategies does the State intend to adopt to establish **quality of care as a core value** in all its health care facilities. This requires a culture change within the health care facility staff of each facility. This is best done on-site and whole site, by teams of dedicated professionals, Quality Champions in each health facility, who do not limit their support to documentation and inputs to achieve prescribed quality parameters for certification purposes. Instead the hospital teams should work towards team cohesiveness and team pride in improving quality of services in all aspects of hospital services with focus on outcomes for patients and patient satisfaction.

Policy Direction 4

The State Health Department should make fullest use of available technology to make good quality diagnsotic and medical facilities easily accessible to the people, especiall in rural and remote villages. This is within the reach of the State through available tele-health solutions at reasonable cost and have short gestation period. A task force needs to be constituted to oversee the technological transformation of health services in the State.

G. Deploying Technology – Bringing Medical Care Closer to People

In order to bring good quality healthcare services closer to the people in the State, keeping in view the scattered and remote

locations of villages, especially in the hill districts and well aware of the long continuing challenge of attracting medical personnel to work in the hill districts (the State has one of the lowest doctor population ratios), it is an urgent need to devise innovative strategies to fill the wide gap in access of citizens to good quality health care services.

One of the tested and widely available solutions is **tele-health** (which term used here includes all its sub-branches such as tele-radiology, tele-obstetrics, tele-paediatrics etc.). These technologies are readily available at reasonable cost and can be quickly deployed with reskilling of frontline health care workers connected to specialist hubs at district/State/National level to provide guidance, support and referral, without the patients having to struggle to find a health facility which can cater to their needs for medical attention.

Use of technology to examine patients near to their homes in sub-health centres, PHCs and CHCs through tele-health solutions will not only mitigate several current challenges, which delay diagnosis and treatment, compounding the illness as well as causing hardship and expense, but support counselling and monitoring as well. Another benefit of establishing a technology framework to support healthcare delivery would be **digitization of medical records** and evidence based epidemiological data to guide better planning and target provision of services as per need, reducing wastage and expense.

The State Health Department has piloted the tele-health approach in certain pockets and should scale up to cover the entire State. A task force may be set up by the State Government to help the health department to plan and oversee the deployment of tele-health solutions across all health facilities accompanied by training of health functionaries.

Policy Direction 5

Keeping in view the multiple challenges faced by the State in terms of availability of medical personnel and emerging medial needs of the population, the State should provide policy direction to multi-skill its health functionaries, and establish as system of continuous skill upgradation of its health force, using available technology optimally

H. Making Health Functionaries More Effective – Re-skilling, Multi-Skilling & Supportive Supervision

In order to achieve the challenging targets of Uttarakhand Vision 2030, it is necessary to optimally utilise the available heath care staff and functionaries. This can be achieved in two ways.

Reskilling and Multi-Skilling: One would be to reskill, multi skill and enable them to cater to the changing health care needs of the population, such as non-communicable diseases, mental health and geriatric care and the recent COVID-19 pandemic. Increasing use of high quality standard treatment guidelines and support through tele-health technologies can make them many more times effective than at present. Multi-skilling would have a beneficial impact of boosting their sense of pride in newly acquired proficiency and enable them to stand out amongst their peers.

The skilling drive would need to use several methods, but all methods need to be based on demonstration and practice till proficiency levels are at pre-agreed acceptable levels. Skill courses need to be organised in hospitals or work settings, depending upon the caseload, for provide ample opportunities to practice new skills under expert supervision. Some course could be conducted in medical colleges, others could be conducted in district hospitals and some even at community health centres. These skill courses should be supported with high quality audiovisual content to showcase benchmarked good

practices and techniques.

Monitoring for Higher Accountability: Second part of this strategy entails bringing-in higher levels of accountability in the functioning and performance of health functionaires, by establishing well defined roles and responsibilities, setting annual performance targets and defining clear and measurable performance indicators. This coupled with regular and objective performance appraisal would establish a culture of accountability to outcomes.

Higher performance should result in some form of rewards. Greater use of technology to support performance of frontline staff such as ANMs in real time would also bring in an added benefit of closer monitoring of key functions such as ANC services, immunization, counselling families and supporting behavioural changes at household levels.

Policy Direction 6

Integration of AYUSH and Health and Family Welfare activities must be given policy direction, especially to preserve good health and well being and change household level care practices of families in terms of diet, seasonal preventive measures, child bearing and child caring practices, early recognition of symptoms of illness and seeking appropriate and timely treatment of choice.

AYUSH Policy 2018 needs the necessary thrust, to catapult it to become a growth driver for the State, with multiple social and economic benefits.

I. Ayurveda, Yoga, Unani, Sidha and Homoeopathy (AYUSH) Systems – Harnessing Their Well Being Potential

The State has a vast network of health care facilities and personnel of Ayurveda, Yoga, Unani and Homoeopathy systems of medicine. People in the State rely on healthcare services provided by 19 Ayurvedic, Unani and Homoeopathy college hospitals, 8 Ayurvedic hospitals and 659 dispensaries of these three systems of medicine, other than 362 Yoga centres, schools and ashrams. Ayurveda and Homoeopathy doctors provide services in several district hospitals, CHCs and PHCs of the State and there are 647 Ayurveda and Homoeopathy wings in these government health facilities.

Uttarakhand has acquired the distinction of being the Yoga capital of the World and students and practitioners from within the country and from several countries enrol to learn and practice this system of well being. This position must be leveraged to expand the number of centres at carefully identified locations all across the State, improve quality of facilities offered in this centres, enhance the skills of Yoga teachers and the services provided in these centres, to attract a growing number of students and clients.

The State has announced AYUSH Policy 2018, whereby it intends to facilitate integrated programmes on management and prevention of lifestyle diseases though public health activities, propagate science of healthy living; manage wellness centres under NHM; develop AYUSH township, promote AYUSH Grams as centres of wellness and rejuvenation; encourage Yoga Grams and Centres to be established as state-of-the-art Yoga and meditation centres and foster AYUSH Wellness Resorts. An empowered task force needs to provide the stewardship to realise these policy intentions.

Convergence of AYUSH and Health & Family Welfare Departments to jointly promote prevention, good health and wellbeing amongst the people should be the way forward. The two departments must strategize and plan together, and pool resources to bring about improved health maintenance and health seeking practices amongst families. This would result in building an environment of safeguarding good health, good nutrition practices, improved care and hygiene practices, early recognition of illness symptoms, seeking of timely diagnosis and appropriate treatment by professionals, contributing immensely to good health and well being of the people.

Policy Direction 7

The State needs to provide policy direction to strengthen its capacity and capability of timely identification of medical emergenci--es, disasters, epidemics, pandemics and ac--cidents and launching an effective response to the same. Its preparedness and ability to manage medical disasters needs to be strengthened and be responsiveness, keeping in view its topography and climatic challenges. A high quality disaster communication infrastructure and heli ambulance service needs to be established.

J. Health Disaster Resilience - Preparedness for Medical Disasters/Pandemics

The State requires to review and update its medical disaster preparedness and management plan to successfully tackle COVID-19 like pandemics and other adverse health events, food poisoning incidents, natural calamities, landslides and accidents.

The health disaster preparedness system would need to include:

- Maintaining stockpiles of supplies, essential medicines, personal protective equipment, testing facilities;
- Efficient procurement of necessary equipment and their need based allocation;
- Preparation of standard operating procedures (SOPS) and standard treatment and safety guidelines (STSGs) envisaging multiple types of disasters;
- Regular refresher training drills of health functionaries in use of SOPs;
- Clear guidelines on command structures at State, district and hospital levels as well as in disaster relief camps/sites;
- Augment capacity to rapidly deploy decontamination/isolation areas for prompt and effective management of chemical/biological disasters,

pandemics and treatment of communicable diseases of unknown nature.

Use of technology to the fullest extent possible must be made, to instantly communicate with all health personnel and to concurrently monitor the operations, and these two should become integral parts of the health disaster preparedness system.

Training is essential for all health personnel to adopt standard operating procedures related to management of any adverse event, while safeguarding themselves and isolating the affected patients.

GOAL 1	Uttarakhand will revisit its State Health and Family Welfare Policy 2002 and revamp it to become responsive to current and emerging needs and supportive of the SDG goals set for 2030
GOAL 2	Uttarakhand will develop a ten year social behavioural change communication strategy and steer a paradigm change in its approach to public health by making behavioural change as its core strategy to improve health seeking practices
GOAL 3	Uttarakhand will undertake comprehensive approach to make quality of medical care a core value amongst all its health personnel and equip and train them to achieve this objective.
GOAL 4	Uttarakhand shall make fullest use of technology to make good quality medical services easily accessible to all its people and rapidly upgrade and launch tele-health services across the State
GOAL 5	Uttarakhand will reskill and multi -skill its health personnel to cater to the current and emerging health care needs of its people. The State will strengthen supportive supervision of health personnel making optimal use of technology
GOAL 6	Uttarakhand shall integrate AYUSH and Health Department's plans and activities to promote good health and well being of its people throug h joint actions aimed at improving health preservation and ill health prevention behaviour. AYUSH Policy 2018 will be provided necessary thrust to realise the potential of AYUSH to become a growth driver of the State on social and economic fronts.
GOAL 7	Uttarakhand shall strengthen its capacity and capability to effectively respond and manage medical emergencies, disasters, accidents and pandemics such as COVID-19 and shall train its health personnel in seamless adoption of prescribed protocols.

Goal	Action No	Actions/Sub-Actions	Time Frame	Actors
1	1.1.	Form a State Health Policy Review Task Force (**SHPRTF**)	1 Month	Government
	1.2	Prepare its District and State Health Action Perspective Plans 2024	3 Months	Government, **SHPRTF**, Technical Assistance
	1.3	Prepare State Implementation Plan 2021-22	6 Months	Government, **SHPRTF**, Technical Assistance
2	2.1	Form a Task Force to craft a comprehensive behavioural change communication strategy 2020-2030 (SBCCTF)	1 Month	Government
	2.2	Prepare a State behavioural change communication strategy 2020-30	3 Months	Government, SBCCTF, Technical Assistance
	2.3	Prepare State Behavioural Change Communication Strategy and Plan for 2021-22 and include it in the NHM PIP 2021-22	6 Months	Government, SBCCTF, Technical Assistance

3	3.1	Constitute a State Quality Improvement Task Force (SQITF)	1 Month	Government
	3.2	Identify Quality Champions in District Level Hospitals and CHCs	2 Months	Government, SQITF, Dist. QCs, Technical Assistance
	3.3	Train Quality Champions		
	3.4	Develop Infrastructure Upgradation Plans for District Hospitals and CHCs	3 Months	Government, SQITF, Dist. QC, Quality Champions, Technical Assistance
	3.5	Develop Quality Improvement Plans (QIPs) of District Hospitals and CHCs	6 Months	Government, SQITF, Dist. QC, Quality Champions, Technical Assistance
	3.6	Quality Champions coordinate implementation of QIPs, establishing quality culture in the hospitals	12 Months	Government, SQITF, Dist. QC, Quality Champions,
	3.7	District Quality Consultants trained as trainers work with PHCs and SHCs to establish quality culture and support quality improvement	18 Months	Government, SQITF, Dist. Quality Consultants
4	4.1	Form a task force to prepare technology integration plan in the state health system (STITF)	1 Month	Government
	4.2	STITF prepares the State Technology Improvement Plan STIP)	3 Months	Government, STITF, Technical Assistance
	4.3	State includes the STIP in the 2021-22 NHM PIP	6 Months	Government, STITF, Technical Assistance
	4.4	STITF steers implementation of STIP	12 Months	Government, STITF, Technical Assistance
5	5.1	Form a state health sector skill development task force (SSDTF)	1 Month	Government
	5.2	SSDTF identifies skill gaps and develops skills development modules for reskilling and multi - skilling of health personnel in District level hospitals and CHCs	6 Months	Government, SSDTF and technical assistance
	5.3	Training of trainers in each medical college and district level hospital to conduct skills development courses	3 months	Government, SSDTF and technical assistance
	5.4	Reskilling and multi -skilling courses are conducted for health personnel in district hospitals	12 Months	Government, SSDTF and technical assistance

6	6.1	Convergent action task force is constituted consisting of AYUSH & Health Dept. Officials (CATF)	1 Month	Government
	6.2	CATF develops a convergent action plan	3 Months	Government, CATF, Technical Assistance
	6.3	CATF steers implementation of the convergent action plan	12 Months	Government, CATF, Technical Assistance
	6.4	Form AYUSH 2018 task force to prepare plan to implement policy intentions of AYUSH Policy 2018 (AYUSHTF)	1 Months	Government
	6.5	AYUSHTF develops a 4 year AYSUH 2024 plan to implement AYUSH 2018 Policy intentions	3 Months	Government, AYUSHTF, Tourism Dept., TA
	6.6	AYUSHTF steers the implementation of AYUSH 2024	4 Years	Government, AYUSHTF, Tourism Dept., TA
7	7.1	Form Tasks Force to Review the State Disaster Preparedness for Medical Disasters (SMDPTF)	1 Month	Government
	7.2	SMDPTF prepares the State Plan 2024 for 4 years	3 Months	Government, SMDTF, SDMA,
	7.3	SMDPTF steers the implementation of State Medical Disaster Preparedness Plan 2024	4 Years	Government, SMDTF, SDMA,

CHAPTER 8
Data for Decision Making

Abstract

Data Driven Decision Making (DDDM) is a process of analyzing patterns from the data collected in order to develop strategies and align activities that benefit the society and economy. Data must be leveraged to make more informed and powerful data driven decisions. E-Governance initiatives are major enabler to collect reliable and accurate data for various DDDM processes. However, most of the time the data thus collected remains in systems and files. There are only a handful of examples where the central or State government has used the pyramid of data thus collected for analytics and using the prescriptions of the analytics for effective decision making.

The IT sector in the State of Uttarakhand has consolidated its strengths by digitizing many of the public services, especially by provisioning these services through the Common Service Centres (CSCs), e-District, State Wide Data Network (SWAN), State Data Centre etc. In addition, the IT perspective of Government of Uttarakhand as per the Vision 2030 document is very promising. The projects undertaken by Space Application Centre, Department of Science and Technology are also very promising. However, there are two major lacunae in the current eco-systems of information systems used by various government departments.

Firstly, the data and information collected through various systems is not integrated.

Second, monitoring focus on measuring activities and target group members in terms of outputs rather than results. So state need to focus on developing a culture of measuring results through integrating results in plans, schemes, program, budget and reports etc.

Third, the data and information is idle and not being analyzed to increase the effectiveness of government departments, their services, policy design and monitoring. Therefore, it is recommended to establish a "Cloud and Data Centre for Analytics" (CDCA) that shall facilitate data driven decision making to decision and policy makers by integrating various data sources and promote usage of various techniques like machine learning, artificial intelligence, image recognition, speech recognition and synthesis, deep learning and chatbot / voicebots.

The center shall also research methods of convergence of cloud, mobile, social and big data to move beyond automation of e-Governance systems to leverage the power of analytics in real-time dashboards and decision-making process of governance.

Process Monitoring: Concurrent monitoring of processes of programme implementation and making the results of such process monitoring available in real time, allows programme managers to take evidence based decisions quickly for improvement, as the programmes progress. Periodic evaluations such as mid-term and end term evaluations are post facto and do not contribute significantly to improvement in the programmes that are evaluated. So, State Government need to plan and execute concurrent evaluations. Nevertheless, the learnings of the programs documented in post evaluations need to be integrated in new programs and policies. Process monitoring is based upon measurable indicators based on prescribed processes that each programme is to adopt for realisation of programme objectives. These are then integrated in the programme design and become the basis for regular programme review, feed into programme dashboards at various levels allowing managers at these levels to self monitor as well as be monitored by their supervisors, with the necessary objectivity provided by evidence. The State requires a policy direction to establish Process Monitoring as an essential and integral part of all programmes supported by State and National funds.

8.1 Introduction

Data collected based on measurable goals or KPIs (Key Performance Indicators) is very important for Data Driven Decision Making (DDDM). DDDM is the process of analysing patterns from the collected data in order to develop strategies and align activities that benefit society and the economy. However, the data must be accurate as well as relevant before value can be extracted from the data. Collecting, extracting, formatting, and analysing insights for enhanced data driven decision making is often an all-encompassing task, which naturally sometimes delays entire data based decision making process. Once data is collected and stored appropriately, the development and democratization of business intelligence software empowers users, without deep technical expertise, to analyze as well as extract insights from the data. DDDM helps in creating new business opportunities, generate more revenue, predict future trends, optimize current operational efforts, and produce actionable insights. Data must be leveraged to make more informed and powerful data driven decisions.

E-governance is a landmark initiative by the central government and State governments to bring transparency and efficiency in dealing with public service providers. The basic objective of E-Governance initiative is to "*Make all Government services accessible to people in their locality, through common service delivery outlets, and ensure efficiency, transparency, and reliability of such services at affordable costs to realise their basic needs".* In the year 2006, the central government approved the National e-Governance Plan (NeGP). The NeGP initially comprised of 31 Mission Mode Projects (MMPs) and had eight components,

E-Governance initiatives can also be major enablers to collect reliable and accurate data for various DDDM processes. E-Governance initiatives mostly comprise of Transaction Processing Systems (TPS) or Management Information Systems (MIS), which often are used to provide services to end-users through a variety of channels and improve efficiencies of various government departments. Therefore, E-Governance initiatives are critical to provision of backbone systems for collection and organisation of a variety of data for all DDDM processes.

National e-Governance Plan (NeGP) also proposed to create a State Data Centre (SDC) for States to consolidate services, applications and infrastructure, which could be used to provide efficient Electronic delivery of G2G (Govt to Govt), G2C (Govt to Consumer) and G2B (Govt to Business) services. States could render these services through common delivery platforms, seamlessly supported by core connectivity infrastructure such as State Wide Area Network (SWAN) and Common Service Centres (CSC) connectivity extended up to block and village level.

In addition, various central and State departments regularly collect variety of data related to micro and macro-economic indicators. For example, data related to Population, Area, & Agriculture, Horticulture & Live Stock, Forest, Infrastructure & Tourism, Electricity, Irrigation & Banking, Education & Health and Tax & Revenues. Most of the time, the data thus collected remains in systems and files. There are only a handful of examples where the central or State government have used the pyramid of data for analytics and used the prescriptions of the analytics for effective decision-making. Following is a brief listing.

Sr	Project Name	Government	Department
1	Project Insight	Govt of India	Income Tax

Description

The project was launched in the year 2017 with the objective to catch tax evaders. The project used data mining techniques to track black money. This helped the IT department in tracking down 5000 entities that were in existence despite being de-registered. Artificial Intelligence and machine learning techniques were leveraged to find patterns and trends in various bank accounts during demonetization. It was later reported that 50,000 de-registered companies deposited and withdrew about Rs 17,000 crores during demonetization. The Government leveraged big data to flag accounts with sizable black money deposits.

Sr	Project Name	Government	Department
2	NA	Govt of India	NITI Aayog

Description

NITI Aayog and IBM signed a Statement of Intent (SoI) to develop a model for crop yield productivity This model is going to use artificial intelligence techniques to help farmers in providing real time advisory in Aspirational Districts.. The main objective is to improve the yields of small landholders. Other major objectives of the project are to use technology to provide insights to farmers to improve crop productivity, soil yield, control agricultural inputs with the overarching goal of improving farmers' incomes. For the first phase of the project, 10 aspirational districts have been identified across the States of Assam, Bihar, Jharkhand, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The project will also cover introduction and training of climate-aware cognitive farming techniques and identifying systems of crop monitoring, early warning on pest/disease outbreak based on advanced AI innovations. The project also intends to include deployment of weather advisory, rich satellite and enhanced weather forecast information along with IT & mobile applications.

Sr	Project Name	Government	Department
3	Goods Flow	Govt of India	Ministry of Finance

Description

The transactional level data collected through GST network is being leveraged to analyze the flow of goods and how the trade is carried out in India.

Sr	Project Name	Government	Department
4	Geotagging	Govt of India	Ministry of Corporate Affairs

Description

Many companies only exist on paper or sometimes share their corporate addresses. These companies are generally used by their owners to facilitate bogus transactions. The data consisting of coordinates of the registered companies will act as a key input for mining data in the ministry's IT infrastructure called MCA21, to zero in on companies with a common address, common contact numbers, common directors etc.

Sr	Project Name	Government	Department
5	NA	Govt of Kerala	Kerala Water Authority

Description

The Kerala Water Authority (KWA) of the Government of Kerala is using IBM's Analytics and Mobility solutions to analyze, monitor and manage water distribution in its capital – Thiruvananthapuram. Due to various reasons like poor quality of pipeline & tampering, providing equitable water supply to all the households is a challenging task and thus water supply is not easily accessible to the entire city. IBM developed a big data analytics system to track and monitor water meters across the city, which resulted in improved revenue collection. KWA further intends to use big data solutions to monitor and flag irregularities in water usage using sensors and intelligent meters.

6	NA	Govt of India	Reserve Bank of India

Description

The Reserve Bank of India (RBI) is planning to set up an analytics lab for its in-house analytics. The lab is going to undertake analytics projects from use cases like inflation management, banking supervision and financial inclusion.

7	NA	Govt of Andhra Pradesh	Across Various Departments

Description

The Govt of Andhra Pradesh is employing big data and analytics to launch a real-time monitoring system. The system is intended to monitor the performance of various State departments. The objective of the big data and analytics system is to increase transparency in day-to-day services offered by the government through e-governance channel. The proposed system will collect insights into the performance of government policies, analyze trends and predict the future behaviour of people and systems so that timely corrective measures and interventions can be undertaken. The system will also help in understanding citizens' data, spend patterns of the government, consumption trends and the success of various government policies.

8	NA	Govt of Odisha	Department of Welfare

Description

Government of Odisha is using data analytics technology to ensure that the least served areas can benefit from Government Welfare schemes. Using big data technology, the government is trying to ensure that people below the poverty line have access to food and other facilities.

9	NA	Govt of Rajasthan	Across various departments

Description

Government of Rajasthan has signed an agreement with the US -based data warehouse firm, Teradata. The objective is to create a common data and analytics platform, which can be used by all government departments across the State to collate and utilize data effectively. It is expected to enable a 360^0 citizens' view by unifying multiple databases.

8.2 Information Technology Ecosystem in Uttarakhand

The State of Uttarakhand was created in the year 2000 to give voice to the aspirations of the people in the hills. In co-ordination with the central government, the State of Uttarakhand launched various E-governance programs. The IT sector in the State has consolidated its strengths by digitizing many of the public services, especially by provisioning these services through the Common Service Centres (CSCs). Following are list of various E-Governance projects in the State.

1	e-District

e-District Project has been completed in all 13 districts of Uttarakhand. The project offers 13 services (Caste, Income, Domicile, Character, Solvency, Hill Area Certificate, Freedom Fighter Dependent Certificate, Uttarjivi Certificate, Birth Certificate, Death certificate, Parivar register entry, Pariwar register Copy & Registration in Employment Exchange).
Few services in some districts are showing little transactions. Services are being provided through 132 eDistrict centres, 16 Employment offices and through approved CSCs in the State. 16 Services (13 as above and old age pension, Widow Pension, Handicap pension) are being delivered in pilot district of Pauri Garhwal. After necessary modifications, Revenue Court Services Module started successfully for Dehradun DM court on trial. Under eDistrict Project, approximately 80.22 lakhs applications have been processed in all the districts of Uttarakhand till Sept 2019

2	State Wide Area Network (SWAN)

Contract signing and issuance of work order under process.

3	State Data Centre

In Phase I, State Data Centre was inaugurated on 26th November 2018. SDC Implementation activity is being done. SDC hardware/Appliance/Cabling/BMS/Access Control installation is completed. Integration/Testing/Migration activity is in progress. ISP Connectivity/ Termination/ Aggregation is in progress, and Final Acceptance Test (FAT) is completed. Services on Uttarakhand State Data Centre services are live.
Phase II - Agreement signed on 20 July 2019 and work order released. Equipment are delivered and installation is under process

4	Common Services Centres

Under the title "Devbhoomi Jan Seva Kendra", Govt aims to establish 2804 CSCs in Uttarakhand. Common service centres work as Kiosks, comprising of basic structure such as PC, Scanner, UPS and internet connectivi ty, with the support of which, services are to be provided to people. The CSC operator (called Village level Entrepreneur-VLE), the Service Centre Agency (SCA) that is responsible for a division of 500 -1000 CSCs and a State Designated Agency (SDA) together will provide a three tier architecture support to the project.

The following three units have been defined for rollout of CSC project in the State:

Unit A – Dehradun, Uttarakashi, Rurdraprayag and Tehri

Unit B – Haridwar, Chamoli, Pauri Garhwal, Almora and Baageshwar

Unit C - Nainital, Pithoragarh, Champawat and Udham Singh Nagar

5935 CSCs have been approved for providing e -District Services. In addition, other services such as Aadhaar registration, banking services are being offered by the CSCs

5	Common Application Portal (CAP)

MOU has been finalized & signed between Information Technology Development Agency (ITDA), Uttarakhand and CSC-SPV on 26 Dec 2018. 272 services have been identified from 27 Departments. 19 e-forms for different departments have been developed. Proposal for financial model has been submitted to the State government for approval.

6 AEROSTAT -Balloon Project

For cost effective aerial surveillance, this project involves the design, fabrication and field deployment of a tethered aerostat system. The main objective of the project is to attend to Emergency situations like natural calamities when generally power supply is disrupted, which hinders relief and rehabilitation operations. Aerostats are tethered to the ground with the help of robust communication solution called Self- Contained Relocatable Wireless Communication System using Tethered Aerostats (SeRWiCTAS). Aerostats can remain afloat in air for long duration of time without any fuel requirements. It is expected to benefit all disaster prone areas in various districts of Uttarakhand State. Aerostats connect more than 10 Kms with data speed up to 5 Mbps. MoU has been signed between ITDA and IIT Mumbai. First trial of the project has been successfully completed at Ahmednagar and second successful trial has been completed at Dehradun, IT Park.

7 Centre for Drone Application & Research

MoU between ITDA & National Technical Research Organization, Government of India, New Delhi was signed on 26 Dec 2017. The project aims to establish state of art Centre for Drone Application & Research. The objectives of the centre are to set up a technical facility to develop the capability of Drone Applications in the fields of Forest Survey, Disaster Relief operation by police and establishment of High Tech Training facility for training of Drone pilots

Inauguration of Drone Training and Research Centre had been done on 9 July 2018 and related work is in progress.

8 Detailed Project Report (DPR)

ITDA has come up with a comprehensive and holistic IT policy and e-Governance Road Map (EGRM) to enable mechanisms for Government to deliver citizen services. The roadmap aims at improving the quality, accessibility and effectiveness of Government services to citizens and business. During Phase-I, the State is already in the process of building applications for identified citizen-facing departments. For Phase -II, Govt. has appointed consultants for preparing a Detailed Project Report (DPR) covering entire gamut of activities in the Department of Finance.

The DPR project aims to create flexible and state-of-the-art solution for providing framework for effective e-governance for Finance and its line departments. Other major objectives of the project are

- Build an integrated finance information system to provide efficient transfer, storage and retrieval of information
- Effective and efficient monitoring and control of State revenue and expenditure through Efficient fund management, monitoring ways and means position, monitoring and controlling Government liabilities
- Real time financial position of State finances through integration with various departments and consolidation of Receipts and Payments
- Automated consolidation and aggregation of data, hence more time for value added analysis
- Design of citizen-centric and dependable service delivery mechanism
- Ensuring employee participation with well-designed change management process
- Faster turnaround of treasury transactions
- Automated accounts generation of the State through intra-departmental integration and interface with banks, AG office, State Planning Department etc. for consistent view
- Efficient mechanism for department, DDO's to track targets, budget allotment, payments and receipts

9	Commercial Tax MMP under Finance MMP

The primary objectives of the project includes:

- Web portal for Commercial Tax Department
- Online interface for dealers
- e-Filing of returns by dealers
- Online payment of taxes/ fee and e-Challan management
- Electronic clearance of refunds
- Online dealer ledger
- Online issue of CST statutory forms (e-Forms)
- Enhance monitoring in distribution of various forms issued to dealers
- Decision support system for Tax assessment of dealers
- Online reconciliation of transactions
- Online integration of information among check posts
- Online management of appeals/cases, follow-up notices and disposal
- System generated reports for updating information to TINXSYS system
- System generated reports for better planning of the Department
- Maximization of overall revenue collection

In addition, the IT perspective of Government of Uttarakhand as per the Vision 2030 document is very promising. The following table provides the highlights of the same

	2016	2020	2025	2030	Remarks
Disaster warning through SMS (% of villages)	Nil	70% (high disaster-prone areas)	100		
Automated grievance redressal mechanism for all departments (% of departments)	Nil	40	40	100	
Compulsory computer education - Secondary Schools (% of schools)	10	50	100		
Corporate houses to set up Data Centre Clusters in hilly areas of State	Invitation toCos for setting data centres in the State. Addressing the same through IT policy rolled out	1xDC	2-3xDCs	2-3xDCs	
Boost to ICT&E industry in Government projects	Establishment of SDC, SSDG,USSWAN andState Portal formalization. Empowerment of ITDA with resources viz.NIC, SeMT,UIDAI,CSC.	Based on success of setting up of industries and prevailing policy guidelines in vogue			
Provisioning of G2C services through internet and mobile applications (achievement in % of services)	18	40	70	100	
State departments to undergo GPRs and automation of offices thereby resulting in e - governance (%)	5	20	60	100	
Inter-departmental G2G services to be done electronically (%)	5	20	60	100	
Cashless payment for all G2B and G2C services (% of departments)	Nil	20	60	100	

As per the Vision 2030, the projects undertaken by Space Application Centre, Department of Science and Technology are also very promising. The following table provides the highlights of the same.

Baseline	Targets for		
	2020	2024	2030
Forecasting Agriculture Statistics with Land based and Metrological Data (FASAL)	District level land capability map for all existing crops in Uttarakhand State.	Village level land capability map for all existing crops in Uttarakhand State.	Mapping of changing pattern in agriculture crops over the period.
Water quality mapping in 13 districts of Uttarakhand	Mapping of Pre and Post water quality parameters, Mapping of waste water sources and sewage in 5 towns, Identification of potential agriculture irriga-tion zones in Uttarkashi and Pauri districts.	Continuous mapping and Monitoring of water quali-ty, Town wise mapping of fifty Towns, Identification of potential agriculture irrigation zones in eight districts of Uttarakhand. Watershed prioritization using Morphometric tech-niques and identification of vulnerable watershed	Continuous mapping and Monitoring and assessme-nt of water quality param-eters using GIS, Town wise mapping of 60 towns, Assessment and water recharge zone identificati-on of potential agriculture zones of Uttarakhand dist-rict, Development of GIS based Watershed Monitor-ing Mechanism for susta-inable development of natural resources, Mappi-ng condition and trends of streams and drainage for vulnerable watershed and identification of fast dwindling rivers for rejuvenation
GIS based city information system for Kotdwara city (e-Kotdwara)	GIS based city information system for Dehradun and Haridwar City	GIS based city information system for 10 major cities of Uttarakhand	GIS based city information system for 20 cities/towns of Uttarakhand

Mapping and monitoring snow and glaciers in Alaknanda, Bhagirathi and Yamuna basin, Automatic snow and grain size mapping of Dundi glacier using Hyperspectral Remote sensing	Snow cover mapping and Glacier retreat studies, Grain size mapping using NDSI and SAM methods, Climate change studies for policy intervention	Continuous mapping and monitoring snow and glac--iers in Alaknanda, hagirathi, Yamuna and Dhauliganga basins, Auto--matic snow and grain size mapping of major glaciers of Uttarakhand Himalaya using Hyperspectral Rem-ote sensing, Climate chan-ge studies policy interven--ion and formulation	Assessment and continu-ous monitoring of snow and glaciers; retreat will be observed in major glaciers in Alaknanda, Bhagirathi, Yamuna and Dhauliganga basins; decadal analysis of snow cover, Assessment of Automatic snow and grain size of major glaciers of Uttarakhand Himalaya using Hyperspectral Rem-ote sensing, Climate change studies for formul-ation and implementation
Assessment of alpine meadows for Medicinal and Aromatic Plants, NTFPs/RET & development of web based information system, Detailed vegetation resourcemaps (species level) and change studies at district level	Meadows for Medicinal and Aromatic Plants, NTFPs/RET & develop-ment of web based inform-ation system, Development of Gram Panchayat level geo-spatial resource maps of for one district (Pithoragarh), Ecosystem Services assessment in selected Natural Sacred Sites (SNS), Geospatial vegetation assessment of 5 Protected Areas of Uttarak-hand, Development of imp--ortant natural resource management system/plan	Decadal assessment of Alpine meadows of the Uttarakhand State, Geo-spatial vegetation resource map (species level) at Gram Panchayat for Uttarakhand State, Ecosy-stem services assessment of natural resources at district level, Geospatial vegetation assessment of all the Protected Areas of Uttarakhand, Develop-ment of species level natural (10 major tree species) resource management system / plan by using high resolution spatial data.	Continuous monitoring of Alpine meadows and iden--tify changes over the period, Monitoring and change analysis of species at landscape Level, Ecosy-stem services asses-sment of natural resources at State level, Geospatial Bi-odiversity mapping assess-ment of all the Protected Areas of Uttarakhand, Development of species level natural resource management system/plan by using high resolution spatial data for the State

Geospatial mapping (geo tagging) of public assets (Infrastructure, Government, Human and livestock and natural resources) and integration in Government schemes of Pithoragarh district (Pilot district).	Geospatial mapping (geo tagging) of public assets (Infrastructure, Government, Human and livestock and natural resources) and integration in Government schemes of 3 districts, Partnership with Universities Technical Institutions, Departments to achieve the goal and giving training to them to disseminate and spread knowledge of Science and Technology, Creation and management of digital geospatial temporal database at 1:50K and 1:10K for multi-thematic layers of Uttarakhand State i.e. Road, Settlement, Drainage, Land Use / Land Cover Wasteland, Land Degradation, Wetland, Forest, Type, Geology, Geomorphology, DEM, Slope, Aspect etc.	Geospatial mapping (geo tagging) of public assets (Infrastructure, Government, Human and livestock and natural resources) and integration in Government schemes at State level. Mapping, analysis and GIS preparation of target Partners, To bring the entire geospatial database of various layers in uniform scale, projections and datum using satellite data, GPS/DGPS in GIS environment, To create Seamless database for all districts of the State at 1:10K & 1: 4K scale of all the themes.	Updation of public assets and integration with the Central and State Government Schemes, Partnership with Universities Technical Institutions, Departments to achieve the goal and giving training to them to disseminate and spread knowledge of Science and Technology. Mapping, analysis and GIS preparation of target Partners, To bring the entire geospatial database of various layers in uniform scale, projections and datum using satellite data, GPS/DGPS in GIS environment, To create Seamless database for all districts of the State at 1:10K & 1: 4K scale of all the themes.

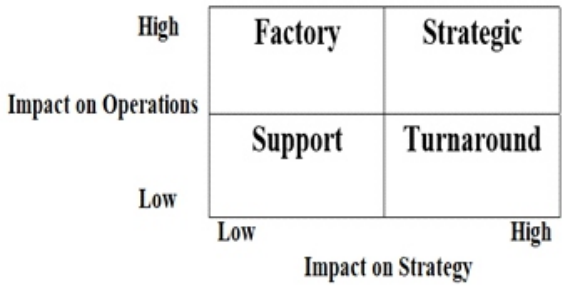
8.3 Opportunities

Under the supervision and guidelines of Government of India, Government of Uttarakhand has initiated various E-Governance projects. There are two major lacunae in the current eco-systems of information systems used by various government departments.

1.The data and information collected by information systems of various departments is not integrated.

2.A bulk of data and information is collected by these information systems but is lying in files and databases and not used to improve the quality of decisions made by the very same departments or other departments.

Most of these information systems are only creating an impact on the day-to-day operations of various government departments. For example, if we classify these systems (existing TPS or MIS) using McFarlan's strategic grid given below, most of these systems are operating in Factory mode or Support mode. There is a larger scope to build high level information systems (offering data mining capabilities, data analytics capabilities, visualizations and projections) which can analyze the bulk of data collected by these low level information systems and derive value out of these bulk of data. Such systems are generally classified as Turnaround or Strategic Systems.



It is a general belief that the terms like data mining, big data analytics, predictive analytics, business intelligence are most commonly associated with enhancing the value of businesses; however, government agencies can derive significant benefits from the field of analytics. In addition to adopting business rules for compliance and eligibility systems, government departments can adopt variety of analytics. For example, Predictive analytics uses various statistical and mathematical techniques using compu-tational power to extract important information from the data to predict future trends and behaviour patterns. In predictive analytics, the captured relationship between explanatory variables and the predicted variables is analysed from past occurrences and mathematical models are built to predict future outcomes.

Government agencies maintain voluminous data in disparate systems and databases. Analytics helps to leverage this vast information about its citizens, projects and activities to effectively utilize resources for efficiency in public services, transparency in governance and improve operations. As the size of the data collected is growing exponentially, traditional data storage and data computational capabilities may not suffice. The data collected by various information systems needs to be extracted, loaded and integrated using advance big-data technologies. The Big Data tools and technology can provide capabilities of mining large data sets in distributed environment, thus help in designing, examining and analysing various government policies. Big data technology provides an opportunity to store and analyse structured (tables, charts) as well as unstructured (texts, geo locations, images, click-stream data, video and audio). Government and citizens, both will be benefited when decisions and policies are data driven. Following are some possible analytics enabled projects that can be initiated.

Data collected by the **Geographic Information Systems (GIS)** can be used for prescriptive analytics by understanding and managing crop yield estimates. With an intention to stabilize agricultural production, prescriptive analytics can improve productivity and empower farmers by recommending them effective, sustainable, economical and eco-friendly technology. Crop Area estimation and loss assessment using remote sensing & geospatial technology can be used for farm yield management and devising effective policies for agriculture.

Artificial Intelligence (AI) and Deep Learningcan prove to be very helpful in detecting duplication under various e-governance services, which will help the government save a lot of money. By integrating data collected by various ministries and government departments, such techniques can take e-governance services to the next level. AI enabled applications can help in building predictive capabilities to track criminal activities, improve law and order and enhance other public utility services. Using historical crime data of time and location, predictive analytics can be used to identify hot spots of crime, trends in community behaviour with respect to crime or provocative activities required to handle or mitigate adverse situations.

Big Data analytics approach which combines the SMAC (social, media, analytics, cloud) and external information can help in **detecting patterns that pose a threat to public safety** or affect the **access to water and power outage**. Security analysts are able to detect patterns in civic violation, or malfunctioning access points of utilities to keep field officials informed. AI enabled applications can help Government Departments to put into place appropriate human resource, set real-life limits on number of human resources, costs, time or even help

in identifying best-fit bureaucrat to handle a situation.

Analytics can also help in **detection of fraud in service deliveries**, especially subsidized services. The effectiveness of subsidy programmes can be measured using analytical capabilities. Many countries have successfully employed retail analytics with smartcards focused on the fundamental needs of water and basic rations. Analytics can also help in **establishing smart cities**. With the help of sensory data, smart city models can be built with increased resilience of infrastructure, business sectors, and citizens against extreme weather events. Sensory data can also be used for predictive analytics, which can predict traffic pattern, spot congestion in real time, thus helping authorities to better manage chaos.

Analytics can help in **quantifying links between climate variability and disease outbreaks**. This is highly relevant for Uttarakhand where seasonal variation is very high and demand for health care services increases and decreases. Analytics can help in predicting degree of health-care required during particular calendar months. Analytics not only can help in predicting quantity and type of medicines required during specific time intervals but also can predict demand of particular class of health care professionals during specific times.

8.4 Recommendations and Conclusion

Even though the information technology eco-system for various government departments in Uttarakhand is adequate, the data and information thus collected is neither analyzed in isolation nor in an integrated manner with other government departments. The role of analytics is fast changing from a descriptive to predictive and prescriptive modes.

Therefore, it is recommended to establish a "Cloud and Data Centre for Analytics" that shall facilitate data driven decision making to decision and policy makers by integrating various data sources and promote usage of various techniques like machine learning, artificial intelligence, image recognition, speech recognition and synthesis, deep learning and chatbot / voicebots. The centre shall conduct research on the convergence of cloud, mobile, social and big data to move beyond automation of e-Governance systems and leverage the power of analytics in real-time dashboards and decision-making process in governance.

A data driven strategy poses to be an essential to move towards a smart citizen centric E-governance promoting transparency and trust in government. This is possible only by harnessing the power of data coupled with descriptive analytics, diagnostic analytics, predictive analytics and prescriptive analytics as indicated in the following figure. CDCA shall facilitate the extraction, loading and transformation of data collected by citizen-facing government departments as well as sensory data (GIS, water bodies) collected and stored by departments, which are not directly citizen facing. CDCA shall facilitate to dump all such data on a data lake. CDCA shall also facilitate various analytical tools and techniques on top of this data-lake that will be used by decision makers for effective development and monitoring of government policies.

Following are some expected outcomes from the CDCA facility.

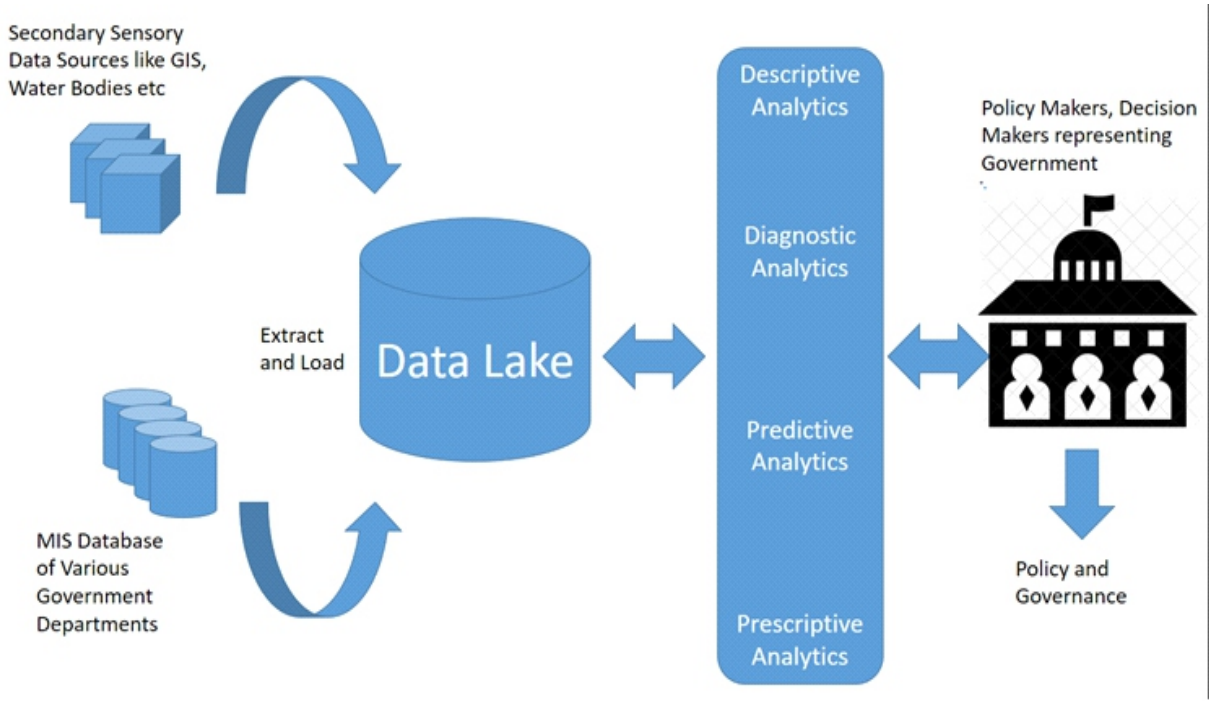
·Decision makers will be able to estimate and predicting economic impacts of changes to tax policy.

- ·Decision makers will be able to take right measures to improve government schemes and programmes (e.g. Social Welfare and health insurance) to alleviate poverty and improve the quality of education.
- ·Decision makers will be able to analyze crime data for improving public safety.
- ·Decision makers will be able to understand the social and economic indicators that can benefit the population by refocusing on areas of lack and allocating necessary resources to prevent waste and boost efficiency.
- ·Decision makers will be able to increase government pro-activity in various areas (e.g. disaster management and effective aid response).

·Decision makers will be able to draft appropriate guidelines for building smart cities

·Decision makers will be able to recommend policies to prevent and reduce all forms of public service corruption (e.g. land registry and reselling of already sold lands).

Process Monitoring to Provide Timely Data for Decision Making and to Facilitate On-going Programmatic Improvements:



Concurrent monitoring of processes of programme implementation and making the results of such process monitoring available in real time, allows programme managers to take evidence based decisions quickly for improvement, as the programmes progress. Periodic evaluations such as mid-term and end term evaluations are post facto and do not contribute significantly to improvement in the programmes that are evaluated.

Process monitoring is based upon measurable indicators based on prescribed processes that each programme is to adopt for realisation of programme objectives. These are then integrated in the programme design and become the basis for regular programme review, feed into programme dashboards at various levels allowing managers at these levels to self monitor as well as be monitored by their supervisors, with the necessary objectivity provided by evidence.

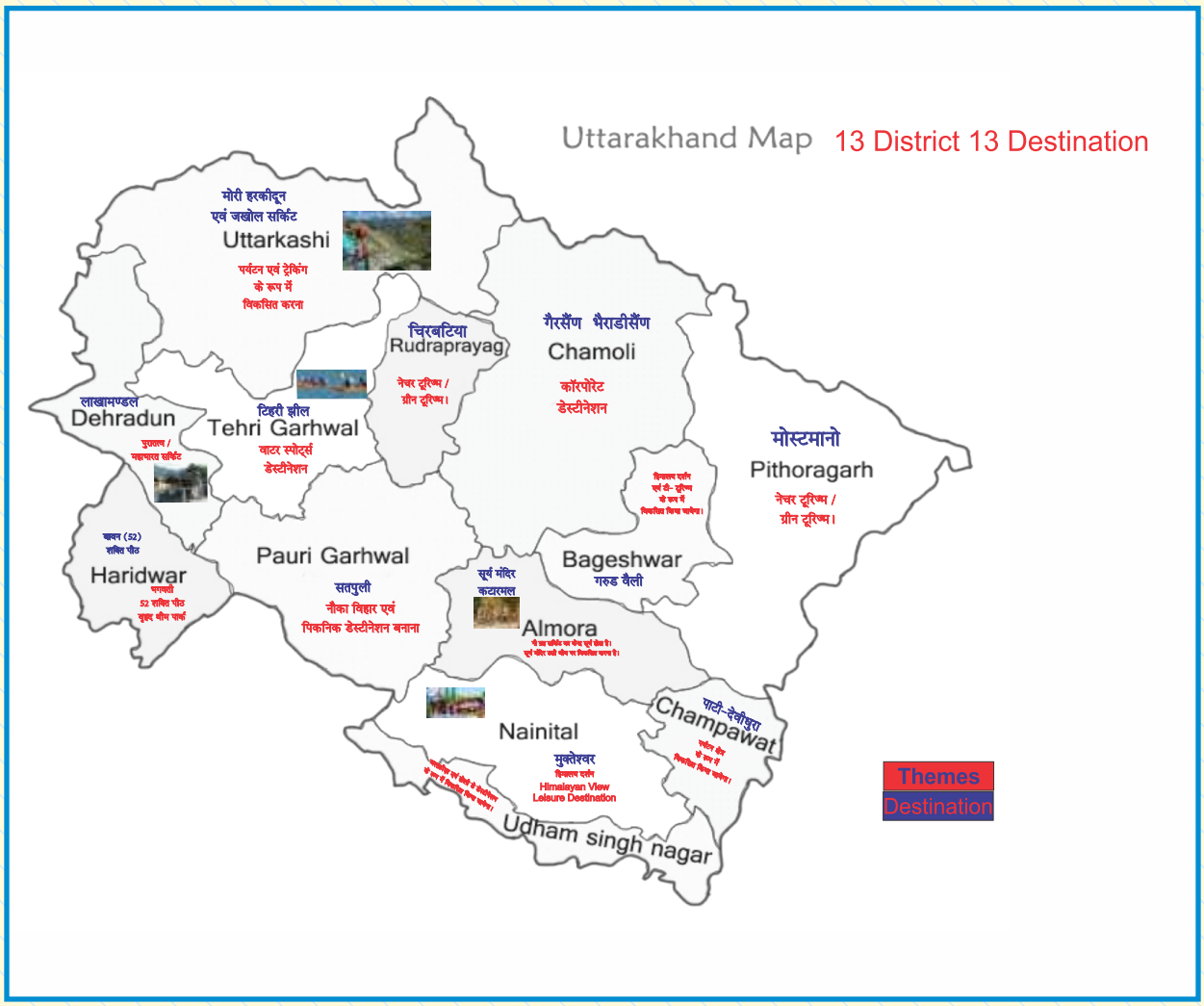
Process monitoring is amenable to automation and supported by data analytics have the power to provide timely alerts and flag up slippages, aberrations, outlier behaviour as well as provide modelling of trajectory of progress in case slippages continue in terms of lack of adherence to prescribed processes.

Process monitoring uses a powerful tool of concurrent beneficiary satisfaction to guide programme managers to gauge the ongoing impact of the programmes, allowing for timely corrective measures and resulting in much higher impact.

Democratic dissemination of the results of process monitoring in the form of dashboards leads to higher level of accountability and alertness and reduces slack in performance on the part of programme managers and functionaries, as when rightly deployed, process monitoring has the potential to dig deep and pinpoint the source of aberration/slackness, to the last functionary.

Government of India has adopted process monitoring of several of its national flagship programmes accompanied with monthly review of the results to interact with States nodal implementation agencies, using data based evidence to discuss and plan improvements.

The State requires a policy direction to establish Process Monitoring as an essential and integral part of all programmes supported by State and National funds. This is bound to have a marked impact on the quality of the programmes, which in turn would lead to greater beneficiary participation and satisfaction.



Directorate of Economics And Statistics
Government of Uttarakhand
100/06, Nehshvilla Road, Gate No. 4,
Dehradun, Uttarakhand

Technical Support by :
Centre for Public Policy and Good Governance
Department of Planning
(Government of Uttarakhand)
4th Floor, Vishwakarma Bhawan, 4 Subhash Road,
Dehradun, Uttarakhand