National Skill Development Agency (NSDA)

Estimation of Skill Gaps

An Analysis of the State-wise vis-à-vis Sector-wise Reports published by NSDC

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July 2013

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Executive Summary

This study was conducted to assess the degree to which the various reports published by NSDC – sector-wise and state-wise – can be used as a planning tool for determining the skill gaps in various sectors and across various states.

This was done by comparing the methodologies used for quantitative estimation across the two sets of NSDC reports, sector wise vis-à-vis state-wise. In the first part of this study, salient features of the two sets of reports are discussed separately. Subsequently, the methodology used across the two sets of reports is compared. During the preparation of this study, NSDC was consulted and their comments have included as part of this report.

Based on the analysis conducted during this evaluative study, the following key findings were made:

- The sector-wise skill gap studies have reported only the incremental manpower requirement and not the *skill gap* in the respective sectors (and they were designed to do so)
- The district-wise skill gap reports for various states have reported the net skill gap as the difference between the incremental manpower requirement and incremental manpower supply for a particular time period. Key issues identified were the non-factoring of *employability* in incremental manpower supply calculations, inconsistency in break-up of skill gaps into different levels across states and variations in approaches used by different consulting firms.
- Based on the reported skill gaps in the state-wise reports, and data derived from the sector-wise reports (assumptions made while deriving this data are included in the report), there is a 33% difference between the incremental manpower requirement estimations of the state-wise skill gap reports and state-specific breakups of the same derived from the sector-wise reports.

In light of these findings, any agency involved in skill development planning should clearly understand the specific context of each report and not aggregate the quantitative skill gap numbers mentioned in them for using them as holistic benchmarks. **Specifically, aggregating the state-wise skill gaps would not result in a true picture of the skill gap prevailing at the national level.**

Estimation of Skill Gaps
An Analysis of the State-wise vis-à-vis Sector-wise Reports published by NSDC

The National Skill Development Corporation (NSDC) has commissioned skill gap analysis reports, classified by economic sectors as well as by States. As on June 2013, skill gap reports for a total of 21 sectors and 14 states have been released.

This study analyses the methodologies used to estimate the skill gaps in the NSDC reports in order to determine the degree to which the findings of the two categories of studies – sector-wise vis-à-vis state-wise – are comparable and compatible.[1]

The first part of this study looks at the concept of skill gap from the theoretical point of view. Subsequently, salient features of the sector-wise as well as state-wise skill gap analysis reports of NSDC are discussed separately. Lastly, the results of the comparison between the skill gap estimation methods across these two sets of reports are analysed.

Skill gap estimation - Approach

The phrase "skill gap" is used in the public arena with varying degrees of understanding of what 'gap' in 'skills' of the labour force actually means. In simple terms, *skill gap* refers to a mismatch between the demand and supply side of the labour market. A more granular approach would address the skill gap as the difference in the skills needed for a job and those possessed by a prospective worker. Thus, the calculation of skill gap can be done using two approaches – (1) Using workforce/employer surveys to estimate skill gaps in the labour force and (2) Using aggregate labour supply/demand indicators to compute skill gaps. A third approach is a *hybrid* of the above two, using a mix of primary survey research coupled with labour supply/demand indicators. Majority of public policy reports, including all NSDC skill gap reports, use this hybrid approach, using level of education as a proxy for skill level.

The Sector-Wise Reports on 'Study on Mapping of Human Resource Skill Gaps'

As of June 2013, NSDC has released skill gap analysis reports for 19 priority sectors in addition to two other reports for Sports and Infrastructure sectors. NSDC had commissioned ICRA Management Consulting Services Ltd., AON Hewitt and Ernst & Young to carry out these studies, with each sector being assigned to one of these agencies. The reports use the following methodology:

[1] **Note** – This study gives an assessment of only the methodology used for **quantitative estimation** of skill gaps across industries or states, as given in the skill gap analysis reports published by NSDC. Qualitative aspects of these reports such as socio-economic profiles of states, overview of different industry sectors, labour force aspirations, qualitative skill requirements across different job profiles, are not covered as part of this study.

- As per the Terms of Reference (TOR) of each report, the sector-wise reports were mandated only to report the *incremental human resource requirement* for the period 2012-22 (using 2008 data as a baseline).
- In order to estimate the manpower demand, the following factors have been taken into account – (i) key demand drivers and risk factors for each sector, (ii) industry trends (policy, production, regulation, market), (iii) private consumption expenditure, (iv) value chain analysis of sector to identify job opportunities & associated skills required and (v) distribution of manpower requirements across job functions & across education levels.

A study of the 21 sector-wise skill gap reports brings out the following issue:

- **These studies have reported only the incremental human resource requirement and NOT the skill gap in the respective sectors**. There is no quantitative estimate of the incremental skill supply from the different institutional training capacities (engineering colleges, ITIs/ITCs, private vocational training providers) for each sector. While incremental human resource requirement is a key indicator in itself, it doesn't adequately capture the skill development needs of a particular sector, where the skill gap would be the difference between the skilled labour requirement & supply in the respective sector. While the reports provide information on the *qualitative* skill gaps existing in the particular sector, they fall short in addressing the issue of *quantitative* skill gaps.

The State-Wise NSDC Reports on 'District-wise Skill Gap Analysis'

As of June 2013, NSDC has released skill gap analysis reports for **14 states**. The studies commissioned by NSDC were conducted by ICRA Management Consulting Services Ltd., Accenture Services Pvt. Ltd., Athena Infonomics India Pvt. Ltd, Ernst & Young and KPMG Advisory Services Pvt. Ltd. for different geographies. The following are the salient features of the skill gap estimation methodology used across these 14 state-wise reports:

- According to the reports, these studies have been carried using both primary and secondary research. Primary research includes in-depth discussions, formal interviews, focus group discussions (FGD) of relevant stakeholders, such as state government departments, district administration officials, skill training providers and skill training beneficiaries. Secondary research includes data collected from various state/district administration agencies such as Department of Economics & Statistics, or any study commissioned by funding agencies etc.
- The *incremental* manpower demand for each sector is approximated using indicators such as sector-wise past growth-rates, regional & national averages, upcoming

investments, employment trends, changing consumer preferences and government thrust policies, etc.

- The incremental manpower demand in each sector estimated as above is further segregated into different types of skill levels ('skilled', 'semi-skilled' and 'unskilled') on the basis of inputs obtained through primary research. This workforce composition is based on matching skill levels with different levels of educational attainment.
- The *incremental* manpower supply at different skill levels is calculated as below:
    - The total manpower supply in the state is estimated using future working population estimates and projected labour utilisation rates of the states
    - The skilled manpower supply (both 'skilled' and 'semi-skilled') is arrived at using current educational infrastructure of colleges (in streams of engineering, arts or sciences), polytechnics and ITIs/ITCs – successful candidates from certain courses have been mapped as 'skilled', while from others mapped as 'semi-skilled' with little standardization across states
    - The 'unskilled' manpower supply is the balance of the total manpower supply minus the skilled manpower supply
- The net skill gap for a time period has been calculated as the difference between the incremental manpower requirement and the incremental manpower supply for the same period. (A comparative analysis of the methodology for skill gap estimation across states is shown in the Endnotes[i])

A comparative analysis of the different state-wise reports brings out the following key issues with the estimation methodology:

1. **The use of educational levels as a proxy for measuring skill** does not give a correct picture of the mismatch between the trained manpower requirement and supply. Educational mismatches don't necessarily imply mismatches between acquired and required skills, which are the gist of skill gap estimation. Hence, such an indirect measure of manpower availability doesn't sufficiently relate to gaps in on-the-job skills. Additionally, using such a measure shows 10 of the 14 states having a *skill surplus*, which is contrary to on-the-ground reality about skilled manpower availability as per various industry groups. In discussions during the preparation of this report, it was pointed out by NSDC that this was the best option available at the time of commissioning of these studies, and suitable modifications in the methodology would be made for future studies in case a better alternative is identified.
2. While majority of the reports mention **employability** of the manpower supply as an important factor, it **hasn't been factored in the incremental skill supply calculations**. Given the mismatch between the curriculums at higher education institutions and TVET

centres, and the skill-sets required in industry, the methodology used in these reports merely represents the number of *prospective* workers and NOT skilled workers who are employable, thus giving a skewed picture of the skill gap number. NSDC clarified that employability has been taken into account for the description of qualitative skill gaps in the states, even though quantitative numbers might not reflect it.

3. The **break-up of skill gaps into different skill levels across states is not consistent**, owing to different definitions of skill levels used. For example, some states count graduates from non-technical streams as 'semi-skilled' labour, while others include them in the 'skilled' category. The skill gap report of Odisha, in particular, uses a different breakdown of skill levels where it doesn't account for the unskilled workforce (upto primary school level education), thus giving high skill deficit numbers. Owing to such inconsistencies in the methodology, it appears difficult to benchmark the requirements amongst various states on the basis of these reports.
4. Another important issue is the treatment of ITI graduates (that form part of the *semi-skilled* manpower supply estimation) and graduates from different colleges such as engineering, arts, sciences etc. (which form part of the *skilled* manpower supply estimation) in the skill gap analysis. While it is known that the majority of ITI pass-outs belong to only certain trades such as electrician, fitter etc., this lump-sum of semi-skilled manpower supply has been treated as an aggregate and not broken down into training capacities for different sectors, thus painting an incorrect picture. Similarly, the supply of skilled graduates from different higher educational institutions hasn't been broken down into different streams, which is also not a correct estimation of skilled manpower supply.

Thus, owing to the issues identified above, the depiction of the skill gaps in these state-wise reports is not completely accurate, and this needs to be borne in mind when used for the planning of interventions to address the skill gaps in the respective states.

NSDC Sector-wise reports vs. State-wise reports – A comparison

The sector-wise and state-wise skill gap analysis reports published by NSDC have the following differences in their methodologies:

- **The state-wise reports give a quantitative estimation of skill gap as the difference between the incremental skill demand and supply in the state. On the other hand, the sector-wise reports project only the incremental manpower requirement and do not talk about skill gaps in the respective sectors**
- **The state-wise reports have estimated the incremental skill supply using education data as a proxy for skill levels. On the other hand, the sector-wise reports have not**

quantitatively accounted for the incremental manpower supply from various training capacities.

In an effort to understand the overall skill picture, an attempt was made to compare the situation depicted by the two sets of reports. In doing so, an estimation of state-wise break-ups of the incremental manpower requirement in the NSDC sector-wise reports was made by the Office of Advisor to Prime Minister on PM's National Council on Skill Development. **It is important to note that these are estimations derived from the NSDC reports, and are not numbers reported in these reports.** The assumptions made while deriving these numbers are listed. (See Endnotes[ii] for detailed analysis).

As per the analysis, there is a **33%** difference between the estimates of the two sets of reports. Although reasonable allowances can be given to the different points in time for the sector and state level studies, a 33% disparity points to a considerable difference in the methodologies used in the skill gap estimations between the sector-wise and state-wise reports.

Comments by National Skill Development Corporation (NSDC)

NSDC was consulted during the preparation of this report, and they offered the following comments:

The Sector-Wise Reports on 'Study on Mapping of Human Resource Skill Gaps

1. The sector studies of 2008-09 aimed to understand the incremental human resource requirement of a particular sector and the qualitative skill gaps that exist in a sector and its sub sector. Sector skill gap studies were first of its kind to be done in the country at a time when the skills landscape was nascent, they were meant to provide an overview of the sectors and the manpower requirements of the sector and the qualitative gaps that existed in the sector.
2. The labour management information system (LMIS) is the way of capturing supply from various sectors and as per the National Skills Policy, the SSCs will be creating the detailed sectoral LMIS.
3. NSDC is in the process of commissioning an update study for the 19 high priority sectors which will update the sector studies while incorporating the feedback and go into further details of the human resource requirement by identifying sub sectors, top job roles, top employer, training infrastructure, etc. For the upcoming sector update study an expert group of industry leaders, ministry representatives and industry bodies will be formed for each sector to ensure continuous inputs and validation of the study.
4. Sector reports 2013 will be carried out using a methodology similar to the district wise skill gap reports. The updated TOR for the sector studies mandates synchronisation of the sector and district wise skill gap studies. The purpose of sector reports 2009 was to provide a mix of quantitative and qualitative insight into skill gaps in these sectors. They neither propose to identify quantitative skill wise deficit in these sectors nor do they give any geographical breakdown.

The State-Wise NSDC Reports on 'District-wise Skill Gap Analysis'

1. The district wise skill gap studies highlight the socio-economic conditions, education and training infrastructure, government and private sector skilling initiatives, incremental manpower requirements, skill gaps in high growth sectors, aspirations of the youth and recommendations to address skill gaps in the State. These studies cater to four different stakeholders – state governments, industry, private training providers and NSDC/ other policy makers.
2. For each district wise skill gap study (post the Odisha study), a steering committee is formed which consists of a representative from the state government (vocational education department or technical education department), industry body and a NSDC training partner. A study is finalised only after approval from the steering committee or an expert group.

3. It is to be noted that the skill gap studies are not meant to be a substitute for the labour management information system (LMIS) for a sector or a state. They are step 0 in the process of creation of the same.
4. Educational level is being used as a proxy basis the methodology agreed upon by different stakeholders and is most acceptable in the country for a macro economic study. Qualitative skill gaps for each district attempt to capture the issue of employability in the study.
5. On the issue of break-up of skill gaps at different skill levels across states not being consistent owing to different definitions of skill levels used, NSDC explains that the methodology for dividing the manpower in the state uses the current educational infrastructure of the state. The methodology provides a certain amount of standardisation but allows for flexibility on the basis of the state the study is being carried out in and steering committee suggestions. This was also done so as not to ensure standardisation to an extent where the nuance of conducting a geographic study was lost. Also, the methodology has been refined substantially between 2011 and 2013. NSDC will be consolidating the studies post September 2013 and that will ensure standardisation to the best possible degree.
6. As regards the supply of skilled graduates from different higher educational institutions, ITIs etc., the mandate of the study was to classify into 3 different skill levels and not into different streams and trades from a quantitative perspective. The detailing into elements like by employer or trade is often taken up by the states.

Conclusion

A study of the methodologies used across the two sets of studies – sector-wise vis-à-vis state-wise – brings out certain differences in the handling of quantitative skill gap estimation, in addition to variations in approaches utilised by different consulting firms commissioned by NSDC.

Taking into account the comments of NSDC on various issues raised in this study, it is clear that the sector-wise and state-wise skill gap studies commissioned by NSDC are customized documents that are catered to meet the requirements of relevant stakeholders across sectors or geographies respectively.

Given the differences in methodologies of the two sets of reports, any agency involved in skill development planning should not aggregate the quantitative skill gap numbers mentioned in these reports and use them as holistic benchmarks. Thus, aggregating the state-wise skill gaps would not yield a picture of the skill-gap prevailing across the country.

For future studies conducted for skill gap analysis, there is a need for a clear understanding of what skill gap is, with a well-defined and consistent approach for skill gap estimation. Furthermore, it is imperative that a consistent approach is adopted for all subsequent studies across all consulting firms commissioned. Such a consistent approach would make it possible to effectively benchmark skilling requirement across sectors and states.

End-Notes

[i]

NSDC State-wise Skill Gap reports - Comparison

States	West Bengal, Madhya Pradesh	Tamil Nadu	Rajasthan	Odisha	North-eastern states	Karnataka
Consulting Firm	KPMG	Athena Infonomics	Accenture	Ernst & Young	IMACS (ICRA Management Consulting	IMACS (ICRA Management Consulting
Incremental manpower requirement (A)	Different methods to estimate for large industries, MSMEs & tertiary sector – using historical growth trends and respective employment intensities	Approximated sector-wise using past growth rates, regional & national averages, upcoming investments & employment trends	Approximated using historical growth, employment rate, technological changes & govt. policy	District wise estimate of future employment growth trends through primary research & taking judgmental assumptions (historical growth, govt. thrust areas)	Approximated using historical growth rates, expected investments, employment pattern, changing consumer patterns, govt. thrust policy	Approximated using historical growth rates, expected investments, employment pattern, changing consumer patterns, govt. thrust policy
Incremental skill supply (B)	Use of working age population estimates & working population rates (decomposed into skill levels based on educational attainment)	Use of working age population estimates & working population rates (decomposed into skill levels based on educational attainment)	Based on current educational infrastructure of ITIs, polytechniques, engg. institutes, migration & employability	Based on intake in educational institutions, coupled with workforce utilization rate	Use of working age population estimates & working population rates (decomposed into skill levels based on educational attainment)	Use of working age population estimates & working population rates (decomposed into skill levels based on educational attainment)
Incremental skill gap	(A) - (B)	(A) - (B)	(A) - (B)	(A) - (B)	(A) - (B)	(A) - (B)

Workforce composition	(i)unskilled (total supply – (ii) – (iii)), (ii) semi-skilled (vocational training), (iii) skilled (graduation in any stream (engg., arts, science) & above)	(i)unskilled, (ii) semi-skilled, (iii) skilled (same as WB, MP)	(i)unskilled (school dropouts, illiterates, (ii) semi-skilled (no formal training, skilling through experience, (iii) skilled (formal vocational training & above)	(i)semi-skilled (diploma, non-engg. graduate, vocational training, (ii) skilled (graduation in technical fields, (iii) highly skilled (MBA, MCA, CA, M.Tech etc)	(i) basic (minimal qualification, 5^{th}-8^{th} pass), (ii) skill level 1 (vocational training), (iii) skill level 2 (engg., arts, science graduates), (iv) highly skilled (specialized skill in any domain)	(i) minimally skilled, (minimal qualification, 5^{th}-8^{th} pass) (ii) semi-skilled (vocational training), (iii) skilled (engg., arts, science graduates), (iv) highly skilled(specialized skill in any domain)
Remarks	Skill surplus projected – but **EMPLOYABILITY** of labour force not accounted for.	**EMPLOYABILITY** of labour force not accounted for	Different breakdown of workforce composition as compared to other states	Unskilled population not accounted due to unavailability of data – thus giving large values of deficits	Skill surplus projected – but **EMPLOYABILITY** of labour force not accounted for.	**EMPLOYABILITY** of labour force not accounted for.

ii

Comparison of Skill Gaps – NSDC State-wise reports vs. Estimations from NSDC Sector-wise reports

State	Skill Gap – from NSDC State-wise Reports (2012-17)*	Skill Gap – Estimated from NSDC Sector-wise Reports (2012-17)	Percentage difference
	'000s	'000s	%
Arunachal Pradesh	73	100	36.12%
Assam	617	1,000	62.14%
Karnataka	4,238	5,600	32.15%
Madhya Pradesh	3,991	3,300	-17.31%
Manipur	116	200	71.95%
Meghalaya	124	200	60.96%
Mizoram	70	100	42.83%
Nagaland	49	100	103.76%
Odisha	1,954	1,400	-28.34%
Rajasthan	8,135	4,100	-49.60%
Sikkim	74	100	35.65%
Tamil Nadu	5,125	9,400	83.41%
Tripura	152	200	31.35%
West Bengal	5,045	5,200	3.07%
		Average difference	**33.44%**

*Skill gap estimates for states with data for periods other than 2012-17 have been pro-rated accordingly

Assumptions for pro-rating of incremental manpower requirement from NSDC sector-wise reports to different states

1. *Automobiles & Auto components*

   To estimate the state wise skill gap allocation for Auto sector, 2 parameters have been taken into account:

- State-wise employment share projections: Figures from the NSDC reports are taken for the states with major contribution to the total sectoral employment. For the remaining states, normalised values of proportion of state population to total country population are used (also, zonal shares as per the NSDC Report are incorporated).
- State wise registered Vehicle share: Source MOSPI. This parameter is a proxy for demand for services related to motor vehicles
- Finally weighted average of all these 2 parameters are used to calculate estimates for statewise allocation of skill gap for auto sector

2. *Banking, Financial Services & Insurance*
   Number of bank offices in the state used to split skill requirements across states
3. *Building Construction & Real Estate Services*
   Basic split taken from NSDC sector report on construction; Split of 20% (not ascribed to any states apportioned between states based on urban population (Trendline of urban population vs. split showed regression coefficient of 0.63)
4. *Chemicals & Pharmaceuticals*
   - Split by state dependent on output in Rs. Lakhs as mentioned in ASI 2008-09 statement 17 and 18.
   - Chemicals: This gives accurate splits for ~89% of the total output. Rest 11% triangulated from 2008-09 provisional figures of industry output in MTPA.
   - Pharmaceuticals: 19.2% of output attributed to Karnataka, as it is the only major production area not covered in available data.
   - Assuming that the same states will continue to be the employment hubs for the future as well.
5. *Construction Materials & Building Hardware*
   - For cement and steel, proportion of employment in certain states, and at a zonal level was given. Employment % for states was taken as such, and for the others, the zonal level %ages were normalized among states based on their urban population (assuming that employment in non-production oriented states comes mostly from distribution/retail of the products - which would be higher in urban areas due to greater use of such material in construction in such areas.
   - For machinery and equipment, the output in lakhs for NIC code 28 (machinery and equipment NEC) was taken as a proxy - gave %ages for ~80% of total output for the country (Source: ASI 2008-09). Rest 20% was normalized to the rest of the states based on their urban population (using same rationale as for cement and steel)
6. *Education & Skill Development Services*
   Simple division of skill requirements (from NSDC report) into states based on total population (provisional Census 2011)
7. *Electronics & IT hardware*
   NSDC Report identifies different sub-sectors within the Electronics & Hardware Industry in India, but does not offer state-wise data. State-wise allocations were calculated using ASI State-Industry-wise Employment data for employment in factory sectors for 2007-08 as a proxy variable, for 2 categories:

- Manufacturing of office, accounting and computing machinery
- Manufacture of electronic valves and tubes and other electronic components

8. *Food Processing*

   As per the NSDC report, fruits and vegetable, dairy products and meat and poultry processing are the major segments of good processing industry.
   State-wise allocation for certain states was mentioned in the NSDC skill-gap report. For the remaining states, average of the following parameters was taken to calculate the projected state share in skill-gap:
   - share of state population to the total population
   - weighted average of state share of production of fruits, livestock and milk in the total production

9. *Furniture & Furnishings*

   Weighted average of urban-rural population with 70:30 weights, are used to calculate estimates for statewise allocation of skill gap for F&F sector

10. *Gems & Jewellery*

    The NSDC Report on Gems & Jewellery provided zonal allocations for human resource requirements in the sector which were used for calculating the projected statewise allocations. Some state shares were mentioned, which were included in the calculations. For the rest of the states, zonal population shares were used as proxies to allocate skill gap requirements across them.

11. *Healthcare*

    Split of future requirement in healthcare directly proportional to weighted average of urban (65%) and rural populations (35%)

12. *Infrastructure*

    Basic split taken from NSDC sector report on construction; Split of 20% (not ascribed to any states apportioned between states based on urban population (Trendline of urban population vs. split showed regression coefficient of 0.63)

13. *IT & ITES*

    NSDC Report identifies existing and projected major centers for IT/ITES in India. In the absence of state-wise data, figures were calculated as explained below:
    - 75% of Skill gap was assumed to be from existing and expected major centers. This was apportioned on the basis of total population of cities which are major IT centers. Karnataka thus gets a statewise allocation of 9%
    - For the remaining states, allocation was done on the basis of state populations, from the 25% remaining pool

14. *Leather*

    In statewise percentage employed in the sector, 6% representing other states (Source: NSDC'S Report on Human Resource & Skill Requirements in the Leather & Leather Goods Sector--2022) was divided amongst the remaining states as per their respective populations (Census 2011--provisional)

15. *Media & Entertainment*

As per NSDC Report, TV & Film Production have a combined share of 29%, TV & Film Distribution a share of 64% and Radio 4%. In the absence of state-wise data, the allocation was done on the basis of 2 components:

- The 30% component of TV & Film Production was distributed on the basis of language-wise share of films released, with all Hindi films allocated to Maharashtra. Films included in 'Others' were distributed on the basis of urban populations of the remaining regions, due to the lack of data availability for any other suitable parameter
- The remaining 70% component was allocated on the basis of urban population across all the regions due to the lack of data availability for any other suitable parameter

16. *Organised Retail*

Weighted average of population in cities where population is greater than one million, cities where population is greater than one lakh and urban population; and expected rate of growth in the state

17. *Textiles*

- More than 80% of silk production in 2011-2011came from Mulberry Raw Silk production and hence a statewise share of mulberry raw silk production has been taken as the proxy for allocating percentage shares to states for sericulture. (Source: annual Report, 2010-2011 of the Central Silk Board, GOI)
- As per the Textile Ministry Website (http://texmin.nic.in/policy/Fibre_Policy_Sub_%20Groups_Report_dir_mg_d_20100608_5.pdf) 10 major wool producing states are mentioned. Values of three states: Punjab, Rajasthan and Haryana were mentioned in percentage terms. The remaining 23% of the other states was divided amongst them as per their populations.
- The data for number of handicrafts clusters per state was used as a proxy of the human resource requirements in the handicrafts sector. Source: Foundation for MSME Clusters, (http://www.msmefoundation.org/folder/Publication/49.pdf)
- The three main sub-sectors constituting the NSDC skill gap in the allied Textiles Sector were: Woollen, Handicrafts and Sericulture. Statewise skill gap was thus calculated by assigning shares for each state by taking different proxies for these three sub-sectors. The rest of the minor contributors (handloom and jute) were then apportioned to the states based on the overall contribution of each state to the skill gaps in the prior three areas combined.

18. *Tourism*

Based on number of domestic and foreign tourist arrivals in each state per year; 70% weight assigned to foreign tourist arrivals (given higher need for tourism services for this segment e.g. translator, guide etc) and 30% to domestic tourist arrivals.

19. *Transportation, Logistics, Warehousing & Packaging*

- Total Skill gap in the sector is analysed according to categories Transport - Road, Sea, Railways Air and Warehouses and 3PL services.
- Weight given to each of the sector is average of current size of sector in total skill gap, and normalised rate of growth expected in the sector.

- Calculation of sector wise weights:
    - For Road: Based on total area covered by roads in each state.
    - For Shipping: Based on tonnage handled in ports of each state.
    - For Railways, Air and Warehousing: Average of infrastructure break-up, and normalised proportion of urban population in each state.