

REPORT

OF THE

WORKING GROUP
ON
VOCATIONAL AGRICULTURAL
EDUCATION



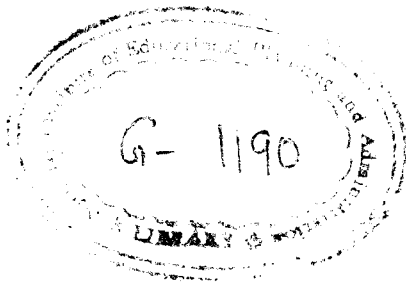
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GOVERNMENT OF INDIA
PLANNING COMMISSION
NEW DELHI



SECTION I

COMPOSITION AND TERMS OF REFERENCE OF THE WORKING GROUP

1. *Recommendations of the Education Panel.*—Prof. V. K. R. V. Rao, the erstwhile Member (Education), Planning Commission, convened a meeting of the Panel on Education in September, 1966, to consider the draft Fourth Plan proposals in respect of education with reference to the recommendations of the Education Commission. One of the Groups set up by the Education Panel related to agricultural education. This Group considered the scheme of Junior Agricultural Schools which was earlier prepared by a Working Group set up by the Ministry of Education and also the recommendations, of the Education Commission on this subject and made the following recommendations :—

“Regarding the Junior Agricultural Schools, the Group was of the opinion that while these might help in dealing with the bulk of drop-outs in rural areas, after the elementary stage, the details of the courses to be offered and the type of institutions to be created should be worked out by a fresh committee to be set up by the Planning Commission.”

2. *Composition of the Working Group on Agricultural Education.*—In pursuance of the recommendation of this Group, as endorsed by the Education Panel, the Chairman, Prof. V. K. R. V. Rao, appointed a Working Group on Agricultural Education at the School Stage, with the following membership :—

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| 1. Shri T. S. Avinashilingam Chettiar | Chairman. |
| Ramakrishna Mission Vidyalaya, Coimbatore. | |
| 2. Dr. K. C. Naik, | Member |
| Vice-Chancellor, University of Agricultural Sciences, Hebal, Bangalore. | |
| 3. Shri M. Y. Ghorpade M. L. A., | ” |
| Sanlur, Bellary District, | |
| 4. Shri N. D. Sundaravadivelu, | ” |
| Joint Educational Adviser, Ministry of Education, New Delhi. | |
| 5. Dr. D. P. Singh, | ” |
| Principal, Agricultural College, Kanpur. | |
| 6. Shri H. G. Patil, | ” |
| Principal, Agricultural Institute, Kosbad Hill, Maharsahtra. | |
| 7. Dr. W. E. Schroeder, | ” |
| Chief of Party, Ohio State University Education Team, New Delhi. | |

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| 8. | Dr. S. K. Mukerji,
Deputy Agricultural Commissioner, Indian Council of Agricultural Research. | Member |
| 9. | Dr. S. C. Verma,
Field Adviser, Regional College of Education, Bhopal. | " |
| 10. | Dr. S. N. Saraf,
Director, (Education) Planning Commission, New Delhi | Member
Secretary |

The Working Group met on 22nd November, 1966 and on 13th September, 1967.

3. The name of the Special invitees, who attended the meetings of the Working Group, are as under:—

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| 1. | Dr. A. C. Joshi,
Adviser (Education), Planning Commission. | Attended on 22-11-1967 |
| 2. | Shri I. J. Patel,
Vice-Chancellor, Sardar Patel University, Anandnagar. | do |
| 3. | Shri D. P. Nayar,
Senior Specialist (Education), Planning Commission. | Attended on both days. |
| 4. | Dr. T. S. Gill
Agriculture Division, Planning Commission. | Attended on 13-9-1967. |
| 5. | Shri K. P. A. Menon,
Secretary, ICAR., Ministry of Food & Agriculture. | Attended on 22-11-1967 |
| 6. | Shri A. H. Hemrajani
Director (Education), Planning Commission- | do |
| 7. | Shri J. S. Pardesi,
Lecturer-in-Extension Work, Department of Adult Education, N. C. E. R. T. | Attended on 13-9-1967. |
| 8. | Shri N. Perumal,
Directorate of Extension. | Attended on 13-9-1967 & represented Dr. S. R. Barooah. |
| 9. | Dr. L. E. Hedges
Ohio University, Education Team, Agricultural Consultant to Regional College of Education, Ajmer. | Attended on 13-9-1967 |
| 10. | Shri R. P. Singh,
Reader-in-Agriculture Regional College of Education. | Attended on 13-9-1967. |

Dr. K. C. Naik and Shri M. Y. Ghorpade could not attend the meeting on 22nd November, 1966.

Shri N. D. Sundaravadivelu and Dr. D. P. Singh could not attend the meeting on 13th September, 1967. Shri N. D. Sundaravadivelu was represented by Dr. K. V. Varki on 13th September, 1966.

4. *Conclusions of the First Meeting of the Working Group.*---

The following important conclusions were reached in the first meeting of the Working Group.

(a) The Group was of the opinion that formal courses in multi-purpose schools, the Rural Institutes and the Agricultural Colleges have trained men predominantly for jobs and only a small proportion of these people have gone back to the farms. If scientific agriculture had to be introduced on a wide scale, it was necessary that a large number of farmers in the various parts of the country should be given training in scientific agriculture and they should go back to the lands and not for jobs. The whole time three-year course visualised in the proposed scheme of Junior Agricultural Schools formulated by the Ministry of Education, will, however, not meet the need and the Working Group agreed with the Education Commission recommendations that these schools should not be proceeded with.

(b) The Group recommended that it was necessary to provide agricultural courses to the young farmers of the age of 14 and above, who have completed middle school education or who have dropped out during or after the middle stage of education. In these courses, it would be essential to enrol only those boys who have some reasonable scope for entering farming. Further, these programmes should be located in those rural areas which offer potential in agriculture. The instructional programmes in these courses should be completely flexible to suit the community conditions and needs.

(c) The Group recommended that these agricultural courses may be situated in areas which are favourable for agriculture and for intensive agricultural development and could then be extended to other areas. It was felt that these courses may be started in research farms, extension training centres, rural institutes, agricultural schools, agricultural colleges, regional colleges of education agricultural universities, basic training colleges in rural areas with proper facilities, post-basic schools, and also secondary schools having sufficient equipment, land and necessary personnel.

(d) The Group recommended that students in these courses should essentially work on their home farms in association with their parents but for carrying out certain experiments, etc., they should have an opportunity of working on the farms attached to the school or the institution. It was felt necessary that there

should be provision for extension work so that teachers in agricultural training centres would continuously be in touch with their students who have been trained and help them in solving problems of a practical nature.

(e) The Group recommended that the medium of instruction in these agricultural courses should be in the regional language. The basic literature necessary for these courses must be prepared in advance in the regional languages and should be according to the requirements of the locality. Provision should be made for getting all news bulletins, leaflets, etc., which provide the latest information about improved agricultural practices.

(f) In regard to qualifications of agricultural teachers, required for these courses, the Group was of the view that they should be B.Sc. (Agr.) with about five years experience in farming or extension work. These teachers, who would be on secondment from the State Agricultural Departments for a minimum period of 4 to 5 years, should be given short-term two months summer course in teacher training. It was also suggested that this short-term training course in agricultural education could be organised in the Regional Colleges of Education, Rural Institutes, Agricultural Universities and Agricultural Colleges.

(g) The Group observed that it was necessary to give agricultural bias and work experience, as a matter of course, to students in elementary and secondary schools both in urban and rural areas. This could be best done by attaching school kitchen gardens to the educational institutions. This would be of great help in orientating the students to gardening and agriculture.

(h) In regard to the administration of this programme of training in agricultural courses, it was agreed that these should be run by the Ministry of Agriculture in collaboration with the Ministry of Education. It was also suggested that the Ministry of Agriculture should set up a Board with representatives from the Ministries of Education and other concerned organisations. There should also be a similar Boards at the State level for the same purpose. Collaboration at the operational level was essential for ensuring the success of such projects.

(i) The Group suggested that a Sub-Committee with representatives from the Ministry of Agriculture, Agricultural Universities, the Ministry of Education, Rural Institutes, National Council of Educational Research & Training and others concerned may be formed to suggest the type of courses to be offered in these institutions with their education.

5. *Committee of Experts & Drafting Committee.*—The Sub-Committee could not meet till July, 1967, when in an inter-ministerial meeting, convened by the Planning Commission on 15th July, 1967, which was attended by the representatives of the Ministries of Education and Food & Agriculture, it was suggested to set up a Committee of Experts for preparing a comprehensive programme of vocational agricultural education of terminal character, for the consideration of the Working Group as agreed to in the meeting on 22nd November, 1966. The composition of the Expert Committee was under :—

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| 1. | Dr. S. K. Mukerjee,
Deputy Agricultural Commissioner, I.C.A.R.,
New Delhi. | Chairman. |
| 2. | Dr. S. R. Barooach,
Director of Education Training and Farm Advisory
Unit, Ministry of Food & Agriculture. | Member. |
| 3. | Dr. W. E. Schroeder,
Leader of the Party, Ohio State University
Team, New Delhi. | ” |
| 4. | Dr. T. S. Sohal,
Professor of Extension, Punjab Agricultural
University, Ludhiana. | ” |
| 5. | Dr. S. C. Verma,
Field Adviser (Agricultural), Regional College
of Education, Bhopal. | ” |
| 6. | Shri J. S. Pardeshi,
Lecturer-in-Rural Extension Work, Department
of Adult Education, N.C.E.R.T., New Delhi. | ” |
| 7. | Dr. S. N. Saraf
Director (Education), Planning Commission. | Convenor. |

6. The meeting of the Committee of Experts on Vocational Agricultural Education took place on 10th August, 1967, in the Planning Commission. A copy of the summary record of the meeting may be seen in Annexure 'A'. (pp. 23-25). In this Group, the concept of vocational agricultural courses of a terminal character in the light of the conclusions reached in the meeting of the Working Group on 22nd November, 1966, were defined and the objectives of the programme were agreed upon. The Committee of Experts agreed that it would be necessary to draw up a concrete scheme which, among other things, would explain the objectives of the proposal and suggest a draft syllabus, duration of courses, criteria for the location of institutions, method for

selection of students for admission to the courses, recruitment and training of agricultural teachers, administrative and financial implications, phasing of the Programme, manpower and material requirements, etc.

7. It was also decided by the Committee of Experts that since the Regional Colleges of Education had first-hand experience of implementing such programmes, it might be useful to ask them to prepare the draft scheme for the consideration of the final meeting of the Working Group. A small Drafting Committee comprising Dr. W. E. Schroeder, Chief of Party, Ohio State University Education Team, Shri R. P. Singh, Reader-in-Agriculture & M. G. Kelkar, Lecturer-in-Agriculture of Regional College of Education, Ajmer and Shri J. S. Pardeshi, Lecturer in Rural Extension work, Department of Adult Education, N.C.E.R.T., was set up and they finalised the scheme in the meetings on 21st, 22nd and 23rd August, 1967. The drafting committee was assisted in their work by Dr. Hedges & Dr. Jolson, Agricultural Consultates to the Regional Colleges of Education, Mysore & Bhopal, respectively and by Dr. S. K. Mukerji and Dr. S. N. Saraf.

8. The second and final meeting of the Working Group on Agricultural Education was convened on 13th September, 1967, to consider the draft scheme prepared by the Drafting Committee. The scheme, as approved by the Working Group, is given in Section II of this Report.

SECTION II

SCHEME FOR VOCATIONAL AGRICULTURAL
EDUCATION

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9. *Introduction.*—This is a proposal for a programme to prepare farm boys for full-time farming. The development of this proposal is founded upon three basic beliefs: That students should be enrolled who are most likely to become full-time farm operators; that India's farmer of the future should be competent in both technical skill and managerial ability and that farming proficiency can best be developed by applying scientific agricultural and related knowledge to actual farming situations on the home farms on the students.

10. The application of those beliefs led to the formulation of a proposal for a programme of Vocational Agricultural Education which, in several respects, is unique as compared to present programme efforts. For example, criteria and procedures have been suggested to insure that those students will be enrolled who are most likely to become farmers. The proposed instructional programme will emphasize the development of farming proficiency through actual application of knowledge on the home farms of students under the guidance and supervision of the teachers. These supervised home farm experiences will not only provide the student with actual management experience, but will contribute to the establishment of an effective father-son partnership on the home farm. The home farm then becomes an instructional laboratory supported by a combination of general and technical education in the classroom.

11. It is proposed that in the beginning stages this programme should be largely self-contained because the type of student who would benefit from the programme would generally not qualify for or benefit from the regular high school programme. All of the formal classroom instruction, general and technical, will be combined into one core to be taught almost exclusively by the teacher of agriculture. However, it is believed that Vocational Agriculture Education will gradually become an integral part of educational programmes. Very few special facilities will be required for the initial establishment of these programmes, as it is believed that they should draw on already existing resources in the communities, such as research farms, demonstration centres, and departments of extension of agriculture, and community development. One of the major challenges to the teacher will be the intelligent identification and utilization of these resources.

12. It is further proposed that three hundred centres be established during the remainder of the Fourth Five Year Plan Period (1968-74). The suggested phasing includes the starting of twenty-five centres in July, 1968; one hundred additional centres in 1969; and 175 more centres in 1970. It was considered essential to start fewer programmes during the first year, which would be considered a year of exploration to complete a rather basic developmental phase which has been undertaken at the Four Regional Colleges of Education of the National Council of Educational Research and Training.

13. The recommended phasing of these three hundred centres would require 25 teachers in 1968; 125 more teachers in 1969; and

300 more teachers in 1970. The number of students enrolled in 1968 would be 500; 3,125 in 1969; and 9,750 in 1970-71. The first group of 500 students would complete the course in 1970-71; 2,625 in 1971-72, and from 1972-73 onward, the 300 programmes would produce 7,000 products annually. The total cost of the programme during the remainder of the current Plan is estimated at Rs. 42 lakhs. The Time Table for Programme Implementation, Projected Enrolments, Projected Cost of one Programme (Centre) and Total Projected Costs may be seen at Appendices I, II, III and IV respectively.

14. *Objectives.*—The ultimate aim of this programme of Vocational Agricultural Education is to prepare farm boys for establishment as successful full-time self-employed farm operators and as responsible rural citizens. More specifically, the objectives of the programme are as follows :

- A. To provide opportunities for farm students to acquire knowledge, managerial and manipulative skills with a view to higher production.
- B. To develop in the students an understanding and appreciation of farming as a respectable vocation.
- C. To develop in the students those attitudes, understandings and skills necessary for improved rural living and leadership.
- D. To provide opportunities for gainful employment on the home farm to enable students acquire the necessary capital establishments as full-time progressive farmer.

15. *The Institutional Setting.*—The institutional setting for a programme must be in harmony with the objectives. Because Vocational Agricultural Education envisages a close relationship between the student, his father, and the home farm it is important to keep the student in residence at his home, and to locate the programme close enough to the homes of students to permit daily attendance. The physical location should also take into account the fact that Vocational Agricultural Education is not envisioned as being completely separated from educational institution. These courses may be started in research farms, extension training centre, rural institutes, agricultural schools, agricultural

colleges, basic training colleges in rural areas with proper facilities, post-basic schools and also secondary schools having sufficient equipment, land and necessary personnel. Sufficient care should be exercised in the selection of these centres. The students will be able to walk or cycle to such schools each day and the teacher will be able to visit the homes of students frequently. Also, the programme can then develop as an integral part of the educational system as the situation permits.

16. The selection of appropriate locations represents an important aspect of the development of Vocational Agricultural Education. It may be assumed that many rural communities can never be served by these programmes. It is, therefore, essential that the location of programmes should be on a priority basis, that is, in those communities where formal education in agriculture will yield a satisfactory return on the investment. The following criteria are recommended for the selection of schools for Vocational Agricultural Education.

- A. The school should be willing to organize and conduct a Vocational Agricultural Programme.
- B. The school should be located in an area that offers maximum potentialities for agricultural development.
- C. The school should be located in a rural area where students can commute easily to and from school each day.

17. The task of selecting appropriate school locations should be done within each state. It is recommended that a proforma be developed and sent to educational institutions referred to in paragraph 15, which provides some description of the intent of the proposed programmes. Interested institutions should then be invited to submit applications for programmes to the State Board of Agricultural Education. The applications should include data about the community, including some indication of interest on the part of perspective students and parents. Suitable community survey forms should be prepared, for this purpose. In order to carry out the recommended phasing, the following time-table for school selection is suggested :

- A. Twenty-five centres for 1968-69 should be cooperatively selected by February 1, 1968, by them. At least one centre should be selected from each state. Efforts will be made to select centres as close together as possible to facilitate easy supervision.

- B. An additional 100 centres should be selected by February, 1, 1969.
- C. After evolution of the implementation of the programme, additional 175 centres should be selected by February 1, 1970.

18. The following minimum facilities should be provided at each centre.

- A. Classroom(s) to house at least twenty students each. (Rooms to be at least 30 feet by 20 feet).
- B. Necessary furniture for the classroom.
- C. Basic reference materials.
- D. Basic tools and equipment for practical training including workshop tools for training in basic farm mechanics.

The administration should :—

- A. Understand and accept the concept of the vocational agriculture programme.
- B. Be willing to make necessary adjustments in the teachers' daily time schedule to provide for all aspects of the instructional programme.

19. *The Students*.—The selection of appropriate students represents one of the most important and perhaps difficult aspects of the entire scheme for developing programmes of Vocational Agricultural Education. All components of the organizational and operational framework have a direct bearing, essentially the task is one of identifying those young persons who are most likely to farm and to attract them with the kind of programme which is in harmony with their needs, interests and abilities.

20. The following criteria have been recommended for the selection of students :—

- A. Prospective farmers who have an opportunity to move into the full-time managerial operation of a farm.
- B. Physical capability for doing normal farm work.
- C. Within walking or cycling distance of the Centre on a daily basis.

- D. Within the age range of fourteen and twenty.
- E. Have completed at least primary education.

If there are more potential enrollees meeting the minimum requirements than the local programme can handle, then those students in the top range of qualifications should be selected. To the extent possible, students should be enrolled who have demonstrated an interest in farming through their actual involvement in farming.

21. Student selection should begin with a survey of the community by the teacher to determine the number of persons who qualify and exhibit an interest in the programme. A copy of the Student Survey prepared at the Regional College of Education, Mysore may be seen at Appendix V. Personal interviews with prospective student and parents should be conducted to explain programme procedures and requirements. Initial contacts with prospective students should be completed by June 1, 1968, in those communities which plan to open courses from July, 1968. Final selection of students should be completed by July 10.

22. *The Teaching Personnel.*—The Teacher of Vocational Agricultural Education will assume a very broad role. As an educational planner he will be responsible for translating community needs into an instructional programme which will lead to vocational proficiency including effective citizenship. As a teacher he will be expected to help students learn how to put knowledge into practice on the home farm, through demonstrated competence. The success of the entire programme depends upon his ability to identify and utilize human and physical resources to the fulfilment of the objectives of the programme. He must be able to utilize his time effectively. The following qualifications are recommended for the selection of teachers.

- A. The teacher should have, as minimum qualifications, a B.Sc. Ag. degree, with good second class marks.
- B. Possess basic farming skills and knowledge.
- C. B.Ed. Ag. graduate.

23. The success of the teacher will depend partially upon the continuing guidance provided to him especially during the first year of experience in these new programmes. The following procedures are believed to be necessary.

- A. An orientation work shop will also be provided for all new teachers prior to the starting of new programmes. These workshops will be scheduled each year from June 15 to 30. The workshop will emphasize all major aspects of the programme for the coming school year. The orientation workshops will be conducted each summer by the Regional Colleges of Education and other appropriate institutions.
- B. Supervision will be done periodically by the Regional College Staff and the staff of the State Directorate of Agriculture. At the same time the State Director of Vocational Agriculture will receive his initial orientation. The supervision will, thereafter, be the responsibility of the State Director, who would be helped by the Staff of the Regional Colleges of Education.

24. The conditions of service of agricultural teachers may be laid down by the Department of Agriculture. The following suggestions are made for consideration.

- A. Be employed as a non-vocational officer.
- B. Be borne on the cadre of the Agriculture Department of the State and deputed to the school for a tenure between 3 to 5 years.
- C. Get credit in form of additional financial inducement for the period spent on obtaining teacher's training.
- D. Get the benefit of all service conditions of his parent department for promotion, etc.

A. PROGRAMME STANDARDS

25. *The Institutional Programme.*—The time schedule for these programmes should also be compatible with other aspects of the programme. It is, therefore, recommended that a time table for classes is developed which would require attendance at the Centre during those periods, when farm work is at a minimum in order that the students may remain at their homes during rush seasons. The length of the day should also permit work at home early in the morning and evenings. The following time table is recommended.

1. Number of days per week— 5
2. Number of days per year—150 (minimum)
3. Number of hours in day— 4 (maximum)

The timings of the course may be according to local requirements.

26. Consideration should also be given to the size of classes which are assigned to each teacher. Basically one teacher will be responsible for one batch of students, including the formal classroom instruction as well as all on-farm-instruction and supervision. It is believed that a maximum of 25 students will represent a full load for one teacher. It will be noted that the recommended phasing of the enrolments calls for enrolling 20 students in the first year and 25 in the second and succeeding years. The slightly lower enrolment in the beginning takes into account possible lower community interest in the beginning as well as the teacher's ability to cope with more students at that time. It is also recommended that programmes not be started in those communities where at least 10 students are not likely to be enrolled in the first year.

B. PLANNING THE INSTRUCTIONAL PROGRAMME

27. No uniform syllabus or duration has been prescribed for these programmes because it is believed that the instructional programme should be directly based upon community needs. The aspects are recognized as important in planning the programme : A survey of the community to determine needs and the translation of these needs into a syllabus. Duration of the course will be determined by the need of the particular course undertaken.

28. The following procedures are suggested for conducting a community survey.

- (a) Teacher to observe competencies of farmers in the centre area.
- (b) Teacher to discuss farming problems and competencies with local farmers.
- (c) Teacher to discuss community farming situation with village level workers and other extension officers. The questionnaire, "Competencies of Local Farmers in Performing Certain Jobs or Skills", may be used in this part of survey.
- (d) Teacher should consider what standard or basic farm skill to include in the instructional programme.
- (e) Teacher should combine his own observations, the recommendations of local farmers, the recommendations of extension workers, plus the common farm skills into a basic curriculum for the Vocational Agriculture Programme.

29. The following procedures are recommended for planning the instructional programme:—

Determine what to teach:

- (a) Determine specific needs of community. These specific needs should have been identified during the initial survey of the community by the teacher.
- (b) Relate these needs in terms of specific job or skills or management decisions.
- (c) Determine those common or standard farm skills needed by all farmers. As a guide, the teacher may refer to Appendix VI, "Selected Skills to Be Taught in Vocational Agriculture Programme in India".
- (d) List these selected skills as "Lesson Units".
- (e) Determine those basic general education principles that students need to know in order to be a successful farmer. Suggested general education principles in the subject matter areas of biology, mathematics, science and physics, chemistry, and language are found on pages 38 and 39 in Appendix VI.
- (f) Integrated basic general education principles with appropriate agricultural lesson units.

30. The success of the Vocational Agriculture Programme will largely depend upon "What We Teach". Only appropriate and useful information, having a direct bearing on the needs and problems of the students, should be selected by the teacher. Much of the related information which is just "Nice to Know" should be left out.

31. The emphasis should be on the application of principles. An opportunity or learning situation to practice the principles learnt will strengthen the base on which to build farming experiences. Decision-making should be the key ability to be developed by the teacher in the students. This will enable them to solve problems rather than to memorise facts.

32. Most villages will not be in a position to supply teachers of other subject matter areas for students in the vocational agriculture course. The vocational agriculture teacher will, of necessity, have to teach basic skills in other subject areas that are needed by boys preparing to farm. At the present stage in the planning of the vocational agricultural programme, it is intended

to teach basic skills in the subject areas of mathematics, biology, science and physics, chemistry and language as parts of the agricultural instruction. In other words, the syllabus for the vocational agriculture programme will be built around a core of "common learnings" or basic skills. Therefore, the students will not have specific classes in subjects such as those mentioned above. The basic principle in these subjects areas will be taught as part of the farming skills. For example, germination of seeds is a basic principle in the study of biology. The teaching of this principle can easily be integrated with the instruction in crop production skills. Farmers need to know the mathematical skills of addition, subtraction, multiplication, and division. The teachers, for example, can give instruction in basic mathematical skills while teaching his students how to balance rations for livestock.

Determine when to teach it :

- (a) Arrange the selected lesson units in appropriate sequence during the duration of the programme. The units of instruction should be scheduled as nearly as possible to coincide with the decisions being made and the operations being performed in the agriculture of the local community.
- (b) Instruction in basic science of soils, plant and animal life as it relates to agriculture should be provided in the first year of the instructional programmes.
- (c) Some basic instruction in agricultural mechanics should also be provided in the early phase of the programme.
- (d) Basic experience in record keeping, summarization and analysis of business records should be provided in the earlier stages of the programme.
- (e) The students should be exposed to the total farm business management situation in the intermediate stages of the programme. This will require :
 - (i) Teaching of basic principles of soil, plants and animal science as they relate to total farm business management situation.
 - (ii) Providing training and experience in marketing food and fibre.
 - (iii) Providing training for the selection, operation, maintenance, and repair of agriculture and processing equipment used in the agriculture area.

- (iv) Providing understanding and ability to make sound farm management decisions through complete farm record keeping, summarization, analysis and adjustments for balanced farming programmes as opposed to individual enterprises.
- (f) In the last stage of the vocational agriculture instructional programme, the teacher should provide opportunities for the student to apply his knowledge, skills and abilities to actual situations through his occupational experience programme.
- (g) The distribution of teaching units should allow for the most effective use of classroom-shop facilities by distributing their use among the vocational agriculture classes throughout the year.

Determine how long to spend on it :

The teacher should determine the number of class periods or on the farm teaching time to spend on a lesson unit.

The amount of time spent on each unit should be determined on the following criteria :

- (a) The present degree of competency of local farmers in the skill (lesson unit).
- (b) The level of competence desired in the student.
- (c) The number and distribution of lesson units during the duration of the programme.

Classroom Teaching :

33. Classroom teaching will be based upon problems growing out of the supervised farming experience of the student. In a sense, a problem or anticipated decision is taken from the farm to the classroom. The students proceed to a satisfactory solution to the problem under the guidance of the teacher. The final solution is implemented on the students' home farms. Necessary related skills are also taught. Thus the students also learn to make sound managerial decisions.

On-the-Farm-Teaching :

34. One of the distinguishing features of the programme is that much of the instruction will be carried out by the teachers on the home farms of the students will be gathered in a field trip situation to learn selected skills or make observations. In other situations, the instruction will be individual and will represent follow-up application of classroom teaching. This on-the-farm

instruction shall be considered as an integral part of the teacher's assignment. The success of the local vocational agriculture programme will depend mainly upon the teacher's ability to carry out this important aspect of the programme.

Supervision of Farming Experiences :

35. Closely related to on-the-farm instruction is the need for the teacher to make periodic visits to the home of each student for several important reasons. Each student will be required to carry out some supervised farming activities (Home Projects). A detailed statement regarding Home Projects in Agriculture may be seen at Appendix VII. It will be the teacher's responsibility to guide in the selection, planning, implementation and evaluation of these farming experiences. In connection with the Home Project Programme, complete records will be maintained by the students. Sample copies of the Record (Crop enterprise and Livestock enterprise) may be seen at Appendix VIII and IX respectively.

Evaluation of Student Progress and Achievement :

36. Formal recognized diplomas will not be awarded in this programme because the specific aim is to produce a self-employed farm operator. Therefore, the question of external assessment to determine student achievement does not arise. However, it is recognised that student growth should be assessed on a continuing basis. Since such assessment is a means of primarily guiding the teacher, it will be his responsibility to assess growth and achievement on an internal basis. The basis for measuring growth and achievement will be the extent to which students are acquiring those skills and making the necessary development toward establishment as full-time self-employed farm operators.

Other Related Activities :

37. Agriculture, like other vocations, needs leadership. Providing opportunities for farm youth in a wide variety of leadership activities has proved to be an effective means of preparing farm youth for their role as citizens and leaders in farm organizations.

38. The teacher should organize rural youth activities such as FFI (Future Farmers of India) which could provide ample opportunity for farm youth to develop leadership abilities, such as public speaking and parliamentary procedure. A sample brochure on FFI may be seen at Appendix X. He will also develop skills such as giving demonstrations, plant identifications, crop and livestock judging and performing farm mechanics skills in contests.

Administration of the Programme :

39. *Administration, Supervision and Evaluation of the Programme.*—The Ministry of Agriculture at the Centre and the Departments of Agriculture in the States will be responsible for administration and supervisions of this programme.

1. *Responsibility at the Central Level :*

The central organisation responsible for administration and supervision of this programme will be called the Central Board of Vocational Agricultural Education which will be set up by the Ministry of Agriculture. This Board should have representatives from the following organisations.

- (a) The Ministry of Food and Agriculture including Directorate of Extension and Department of Community Development.
- (b) Ministry of Education (Bureau of School Education and National Council for Rural Higher Education).
- (c) N.C.E.R.T. (Regional College of Education Unit and Department of Adult Education).

It will be the responsibility of this Board to lay down the policies regarding Vocational Agriculture Education. At the Centre, an officer with the rank of Director will serve as the national leader for the project. He will be responsible for co-ordinating the activities of various Ministries concerned in this field. He will also provide leadership to the States.

2. The Central Director of Vocational Agricultural Education will be appointed by the Ministry of Agriculture. His duties will be to :

- (a) Provide technical guidance in planning, operation and evaluation of the vocational agricultural education programmes organised by the States.
- (b) Provide professional leadership for the establishment and maintenance of programme standards in the States.
- (c) Ensure a constant supply of relevant material including instructional materials needed by the programmes.
- (d) Arrange for allocation of central funds for the State programmes.
- (e) Lay down specific criteria for the selection of professional and technical personnel at various levels.

40. The Centre should finance the entire programme during the Fourth Plan period and thereafter, the State Governments may be asked to accept the financial responsibility.

Responsibility at the State Level :

41. At the State level, a similar Board of Vocational Agricultural Education will be established to facilitate smooth functioning of the Vocational Agricultural Education Programmes in the State with the State Director of Vocational Agricultural Education as the leader of the group. The State Board should have representatives of the Agriculture, Education, Community Development Department and Agricultural Colleges, Rural Institutes, Gram Sewak Centre.

42. The State Directors of Vocational Agricultural Education should be in position in April 1, 1968. They should attend the orientation workshop at a Regional College of Education in June, 1968. They would supervise new teachers selected for the 1968-69 school year. They would also select by February, 1969, those teachers for the schools to be started in 1969.

43. *Responsibility of the Local level as suggested is as under :*

- (1) The programmes may begin in Research Farms, Rural Institutes and Agricultural Institutes and later on be extended in middle or high schools having facilities. Each vocational agriculture teacher would, however, be appointed by the Agriculture Department of the State. When in a school the vocational agriculture teacher would work under the Headmaster of the school, the headmasters should under the flexibility required for the success of this programme.
- (2) The programme should lean heavily on the resources of various local agencies. These may be (a) community development (b) agriculture animal husbandary departments of the State and (c) Department of Education.
- (3) In order to strengthen the local vocational agriculture programme, an advisory committee should be established at the local level. The committee would include representatives of the above agencies plus some local progressive farmers.

Programme of Evaluation :

44. Appropriate evaluation criteria and instruments will be developed by the Regional College of Education and other appropriate institutions for assuring the continued improvement of the programme. This work should be completed by the end of the basic exploratory stage, the end of the year 1969-70.

SECTION III

CONCLUSION

45. The Group strongly recommends that the necessary financial provision for implementing the proposed scheme of Vocational Agricultural Education may be made in the current year by appropriate adjustments if necessary so that preparatory steps are taken for surveying the location of such centres and for the training and orientation of agricultural teachers. It would also be necessary to find finances for the pilot projects of vocational agricultural courses already initiated by the Regional Colleges of Education. We are strongly of the view that this scheme should be implemented, without any delay, and, therefore, commend the projects already taken up by the Regional Colleges because we feel that on the success of these pilot projects will depend the implementation of this programme on a large scale. The Group also strongly recommends that, in the Annual Plan for 1968-69, adequate provision may be made for the setting up of 25 centres during 1968-69 and also for the establishment of necessary administrative machinery both at the Centre and in the State levels so that the effective implementation of the programme is not retarded.

46. The Group in its first meeting recommended that basic literature necessary for these vocational agricultural courses must be prepared in advance. The recommendation is again reiterated and it is suggested that the appropriate Ministries may set up necessary machinery to make an assessment of the instructional materials, guide books for teachers and other manuals which are already available and also make an assessment of the additional literature required. In this connection, our attention was drawn to the instructional materials prepared by the N.C.E.R.T. in Biological Sciences which is proving very useful and we suggest that this type of literature may be produced in the field of agricultural sciences also which would be relevant to the proposed schemes of vocational agricultural courses.

47. The Group hopes that the Planning Commission will take necessary steps in circulating this scheme to the appropriate Ministries and Departments at the Centre and in the State and

commended its early implementation. We are informed that the question of providing necessary funds for this scheme will be decided by the Education and Agriculture Divisions of the Planning Commission with the concerned Ministries. We are keen that decision on this and other recommendations may be taken early.

48. The Group has not gone over tracing the history of the reasons for the failure of agricultural education at the pre-university stage in making an impact on improving the economic condition of people in rural areas. This question has been reviewed by a number of Committees and Commissions. We have, however, kept in view, while drawing up the programme, the various suggestions made by these expert committees and have drawn up a realistic programme which can meet the needs of our country. To begin with, during the Fourth Plan, we have visualised this scheme only as a pilot project with an ultimate enrolment of 9,750 in 1970-71. We believe that financial consideration should not come in the way of the implementation of this programme as we believe that the condition precedent for having a break-through in our agricultural economy is the extent to which it is possible for the society to make necessary provision for the introduction of agricultural education based on science and technology at various levels and more so at the level when the young farmers have the capacity to absorb the significance of the adoption of new techniques.

49. Finally we take the opportunity of conveying our thanks to the Drafting Committee for the pains they took in preparing the scheme in all its details. We are grateful to them for accepting this onerous responsibility which they have discharged with great credit. We cannot conclude our acknowledgements without expressing our indebtedness to Dr. S. N. Saraf, Member-Secretary of the Working Group for the services he rendered in the form of documentation for the various meetings, providing the necessary secretariat assistance and arranging the meetings of the group and its committees. He was great source of un-failing strength and helped considerably in drafting the final report of the Working Group.

Summary record of the meeting of the Committee of Experts on Vocational Agricultural Education held at 11.00 A.M. on 10th August, 1967, in the room No. 241, Yojana Bhavan, New Delhi.

The meeting of the Committee of Experts on Vocational Agricultural Education took place on 10th August, 1967. The following were present :

Dr. A. C. Joshi—*Chairman*

Dr. S. K. Mukerji

Dr. S. R. Barooah

Dr. W. E. Schroeder

Dr. S. S. Sohal

Dr. S. C. Verma

Shri J. S. Pardesi

Dr. S. N. Saraf.

2. Dr. A. C. Joshi, Adviser (Education), initiating the discussion, explained the main features of the proposed scheme of vocational agricultural courses. He observed that in spite of the fact that many Commissions and Committees had recommended the idea of vocationalisation of education at the secondary stage, no concrete programme had been worked out and in the absence of this it was difficult for the Education Departments and the Principles of Schools to implement a worthwhile programme. Referring to agriculture as the basic industry of the country, Dr. Joshi thought that it was high time that a concrete programme was worked out which would give the right type of education and training to our future farmers in scientific agriculture. If a long term view of developments in the country is taken, it would be observed that, after compulsory education upto the age of 14 is fully introduced, millions of children would be coming out of schools who would not go in for higher education but would like to stay on their land as progressive farmers. It would, therefore, be necessary, as had been done in other

advanced countries, to prepare vocational agricultural education programmes much in advance, which could be implemented without any difficulty and which is more tuned to the requirements of various localities. He referred in this connection to the scheme of Home Projects which have been successfully implemented in some Regional Colleges of Education and observed that an extension of this programme for those people who had dropped out from schools and were working as farmers, would be a worthwhile programme. He thought each district might have such a centre.

3. Dr. Schroeder explained briefly the concept of Home Projects as they are being worked out in the Regional Colleges and explained in detail the proposals for a pilot terminal agricultural programme at T. Narasipur, Mysore State. The main idea behind the proposal of agricultural terminal programme was that the rural school drop-outs of middle and high schools, who return to the village with very little knowledge, skill or ability to take up farming, should be given a type of training in farming which was functional, utilitarian and practical. Even if only a fraction of these drop-outs could be involved in this programme of vocational agricultural education they would contribute in any ample measure to the better utilisation of the material inputs for agricultural production. He thought that it would not be a good idea to set up separate centres for training this type of people as it would involve large financial outlays in terms of construction of buildings, acquiring of sites, purchase of equipment, etc., and would also be late the education and training of these people from the general stream of education. It would be ideal to locate these terminal courses in the existing educational institutions which have necessary facilities and are in close proximity to research farms, extension training centres, rural institutes, agricultural colleges, basic training colleges in rural areas, post-basic schools, etc. There was no need for having a big farm for training such people as father's farm would serve the purpose of day to day work. There was, however, a need for a small demonstration farm attached to the school. He thought that the best way by which agricultural production programme could be served was by organising a big programme of such vocational agricultural courses of a terminal character which did not visualise giving of any stipend, awarding a certificate or a diploma or even providing hostel facilities.

4. Dr. Sohal referred briefly to the farmers' training programme initiated by the Punjab Agricultural University. He observed that the 3 months' programme for young farmers orga-

nised by the University had achieved the objectives. He thought that a programme of the vocational agricultural terminal course visualised would be helpful in providing the necessary background to the future farmers in scientific agriculture.

5. Shri Pardesi referred to the survey undertaken by the Department for Audit Education of the N.C.E.R. & T. regarding agricultural education needs of out-of-school rural youth engaged in farming and observed that it was necessary to provide a programme of terminal courses for the school drop-outs.

Dr. Barooah thought that vocational terminal courses of the type visualised would be welcome and could serve as the base for the programme of farmers' training for youth in higher age-groups. He observed that it might be useful to locate these vocational agricultural centres in such institutions which were in high yielding variety areas. Dr. Verma and Dr. Mukerji agreed with the basic objectives of the programme.

6. It was agreed that a concrete scheme might be drawn up which, among other things, would explain the objectives of the proposal and suggest a draft syllabus, duration of courses, criteria for the location of institutions, method of selection of students for admission to the course, recruitment and training of agricultural teachers, administrative and financial implications, phasing of the programme, manpower and material requirements, etc. Since the Regional Colleges of Education had first-hand experience of such programmes, it was decided that Dr. Schroeder, Shri R. P. Singh and Shri Kelkar of the Regional College of Education, Ajmer, might prepare the draft scheme. For this purpose, they would be assisted by other members of the Committee who are in Delhi. It was also decided that the Drafting Committee may meet on 25th and 26th August, 1967. Subsequently it was agreed that the Drafting Committee would meet on 21st and 22nd August, 1967.

APPENDIX I

TIMETABLE FOR PROGRAMME IMPLEMENTATION

Deadline	Activity
1968	
February 1	Select 25 schools for new programmes 68-69
April 1	State Directors in Position
April 30	Select 25 teachers for new programmes
May 1	Select and purchase materials for new programmes
May 15 to June 15	New teachers survey communities-prospective students
June 1	Select 125 new trainees for R. C. E. B. Ed. Course
June 15-30	New teachers orientation at one R.C.E.
June 15	Completion of basic kit and teacher material of instructional material
July 10	School students selected
July 15	Instruction begins in schools
All year	Periodic supervision of teachers
1969	
February 1	Select 100 schools for new programmes 69-70
April 30	Select 25 second teachers for 25 schools and 100 teachers for new programmes
May 1	Select and purchase equipment for new programme
May 15-June 15	New teachers survey communities-prospective students
June 1	Select 300 trainees for R. C. E. B. Ed. Course
June 15-30	New teacher orientation at all R.C.E.'s
June 15	Provide basic instructional materials—teacher materials
July 10	School students selected
July 15	Instruction begins in schools
All year	Periodic supervision of teachers

Appendix I-- *contd.*

1970

February 1	Select 175 schools for new programs 70-71
April 30	Select 25 3rd teachers, 100 2nd teachers and 175 1st teachers
May 1	Select and purchase equipment for new programmes
May 15-June 15	New teachers survey communities-prospective students
June 15	Provide basic instructional materials-- teacher materials
June 15-30	New teacher orientation--All R. C. E.'s
June 30	School students selected
July 15	Instruction begins in schools
All year	Periodic supervision of teachers

APPENDIX II
PROJECT ENROLMENT, 1968-73

	68-69	69-70	70-71	71-72	72-73
25 schools	500	1125	1750	1750	1750
100 schools	..	2000	4500	7000	7000
175 schools	3500	7875	12250
300	500	3125	9750	16,625	21,000

APPENDIX III
PROJECTED COSTS FOR ONE PROGRAMME

Costs	1st year	2nd year	3rd year	Total
Non-recurring—	Rs.	Rs.	Rs.	Rs.
Furniture	1,000	1,000	1,000	3,000
Books, and Instructional material	500	500	500	1,500
Cycle	250	250	250	750
Farm Tools and Equipment	1,000	200	200	1,400
Recurring—				
Instructor salary	3,030 (1)	6,120 (2)	9,360	18,480
D.A. and Housing	1,200	2,400	3,630	7,200
Stationery	200	400	600	1,200
Consumable materials	500	1,000	1,500	3,000
TOTAL 1 PROGRAMME	7,650	11,870	17,010	36,530

APPENDIX IV
TOTAL PROJECTED COSTS, 1968-73

Year	Programmes	Costs
		Rs.
1968-69	25 programmes 1st year	191,350
1969-70	25 programmes 2nd year/100 programmes 1st year	1,061,750
1970-71	25 programmes 3rd year/100 programmes 2nd year/175 programmes 1st year	2,951,000
1971-72	25 programmes 4th year/100 programmes 3rd year/175 programmes 2nd year	4,203,500
1972-73	25 Programmes 5th year/100 programmes 4th year/175 programmes 3rd year	5,103,000
	TOTAL	13,510,600

By 1973 full phasing of 300 programmes would be achieved using 900 teachers and total enrolment of 21,000 students—total output of 7,000 students per year at a total financial outlay of Rs. 13,510,600.

APPENDIX V

STUDENT SURVEY

*Pilot Terminal Programme in Agriculture Regional College of Education,
Mysore-6*

1. Student's name.....
2. Parent or Guardian's name.....
3. Address.....
.....
4. Age of Student.....
5. Standard of School completed.....
6. Name of School last attended.....
7. If discontinued attending school, why?.....
.....
8. Number in family.....
9. Number of Boys in family.....
10. Number of Boys in family at home.....
11. Farm Acres operated Total.....Acres. Dry.....Act. Wet.....Ac.
12. Acres owned.....Acres rented.....
13. Full-time operator.....Part-time operator.....
14. Major Crops Raised.....
.....
15. Livestock Enterprises.....
16. Indigenous or Improved Cultivation Practices.....
17. Is student interested in becoming a farmer.....
18. Is student interested in Agricultural Schooling.....
19. Student's opportunity in becoming established in Farming : Good.....
.....Average.....Poor.....
20. Other observation.....
.....
.....
.....
.....
.....
.....

APPENDIX VI

SELECTED SKILLS TO BE TAUGHT IN VOCATIONAL AGRICULTURE TERMINAL PROGRAMMES IN INDIA

Crop Production :

1. How to select suitable crops for a specific situation.
2. How to select appropriate varieties of crops.
3. How to select good seeds.
4. How to treat seed for seed-borne diseases.
5. How to select the proper crop rotation for a farm.
6. How to prepare a cropping scheme for a specific situation.
7. How to prepare seedbeds for specific crops.
8. How to set up fertilization programmes for specific crops.
9. How to plant the different crops.
10. How to properly irrigate the crops.
11. How to select and properly use appropriate herbicides.
12. How to properly remove weeds by mechanical methods.
13. How to protect the crop from insects and diseases.
14. How to select, use, and maintain plant protection equipment.
15. How to properly harvest crops.
16. How to store and market crop products.

Livestock Production :

1. How to select the appropriate breeds of livestock for the farm.
2. How to select individual animals within a breed.
3. How to care for pregnant females.
4. How to care for young stock.
5. How to care for milking animals.

6. How to care for male animals.
7. How to properly house livestock.
8. How to properly feed breeding stock.
9. How to properly feed meat animals.
10. How to produce quality milk.
11. How to detect, prevent and control livestock diseases and parasites.
12. How to market livestock.
13. How to market livestock products.
14. How to dispose of livestock wastes.
15. How to up-grade farm livestock by improved breeding practices.

Poultry Production :

1. How to determine the most suitable method of starting a poultry flock.
2. How to select a breed and source of baby chicks.
3. How to hatch baby chicks.
4. How to properly feed and water chicks, pullets, and laying hens.
5. How to properly house chicks, pullets, and laying hens.
6. How to prevent cannibalism.
7. How to cull young pullets.
8. How to prepare a laying house for pullets.
9. How to gather, cool, clean, candle, grade, and hold eggs for a quality market.
10. How to keep and analyze flock records.
11. How to cull old hens.
12. How to make an autopsy on a chick or hen, diagnose, and prescribe proper medications.
13. How to grade live birds for market.
14. How to fit and exhibit poultry.
15. How to treat poultry house for control of lice and mites.
16. How to treat birds for worms.
17. How to vaccinate for control of poultry diseases.

Vegetable Production :

1. How to determine if vegetable production will be profitable for a farm.
2. How to select a site for vegetable production.
3. How to select proper vegetables for a farm.
4. How to select the best soil for vegetable production.
5. How to prepare the field for vegetable production.
6. How to select seed.
7. How to treat vegetable seeds.
8. How to sow vegetable seed.
9. How to do intercultivation.
10. How to apply proper amount of manure.
11. How and when to irrigate.
12. How to identify, prevent and control insects and diseases.
13. How to properly harvest vegetables.
14. How to properly store vegetables.
15. How to market vegetable products.
16. How to raise seeds and plants for commercial purposes.
17. How to rotate vegetables throughout the year.

Farm Management:

1. How to select the proper type of fencing.
2. How to construct a fence.
3. How to determine size of plots, roads and irrigation and drainage channels.
4. How to layout the blocks of plots, roads, irrigation and drainage channels.
5. How to determine what buildings to have on the farm.
6. How to locate a well.
7. How to test soil by rapid method.
8. How to identify soil by type.
9. How to determine production capability of the soil.
10. How to manage alkaline soil.
11. How to select a cropping scheme for a farm.

12. How to use mixed-cropping.
13. How to calculate the cost of producing a crop.
14. How to set up a livestock system for a farm.
15. How to determine what farm records to keep.
16. How to keep farm records.
17. How to summarize and analyze farm records.
18. How to use farm records in making management decisions.
19. How to determine a proper wage scale for farm labourers.
20. How to settle litigation problems.

Farm Mechanics and Engineering :

1. How to select, use and maintain the plough.
2. How to select, use and maintain seeding equipment.
3. How to select, use and maintain hand tools used for intercultural operations.
4. How to select, use and maintain bullock drawn implements.
5. How to select, use and maintain irrigation implements and equipment.
6. How to select, use and maintain harvesting implements.
7. How to select, use and maintain plant protection implements and equipment.
8. How to select, use and maintain farm tractors.
9. How to select, use and maintain electric motors.
10. How to select, use and maintain diesel and gasoline engines.
11. How to do simple farm plumbing operations.
12. How to select, use and maintain soil conservation equipment.
13. How to locate contour lines.
14. How to design and construct basic farm buildings.
15. How to select, use and maintain small hand wood-working tools.
16. How to select, use and maintain basic hot and cold metal working tools.

Soil and Water Conservation :

1. Know what are the causes of soil erosion.
2. How to identify the various types of soil erosion.
3. How to control of the various types of erosion.
4. Know what are the causes of water loss.
5. How to conserve water.
6. How to design an economical drainage system for a farm.
7. How to properly drain the farm.

Rural Sociology and Economics :

1. How to identify rural problems.
2. How to determine what taxes to pay.
3. How and when to pay taxes.
4. How to effectively cooperate with other farmers in business activities.
5. How to identify, solve and/or prevent farm family life problems.
6. How to maintain harmony within the farm family.
7. How to select and conduct recreational activities for farm families.
8. How government agricultural programmes operate and how they affect the farmer.

Fruit Production :

1. How to determine if fruit production is profitable for a farm.
2. How to determine which fruits to select for an orchard.
3. How to select the site for an orchard.
4. How to purchase fruit plants.
5. How to propagate fruit trees vegetatively.
6. How to lift and transplant fruit plants.
7. How to properly plant the trees.
8. How to properly apply manure.
9. How to properly irrigate the orchard.
10. How to prune and train the trees.
11. How to protect the orchard from adverse climatic conditions.

12. How to identify, prevent and control fruit insects, and diseases.
13. How to properly harvest the fruit.
14. How to prepare fruits for marketing.
15. How to market the fruit.
16. How to obtain maximum production from an orchard.
17. How to do inter-cropping.

Bee-keeping :

1. How to decide if bee-keeping is economical for a specific farm.
2. How to identify different kinds of bees.
3. How to use a beehive.
4. How to select, use and maintain beekeeping equipment.
5. Know where to locate beehives.
6. How and what feed bees.
7. How to provide year-round supply of flower plants for bees.
8. How to protect bees from predators.
9. How to prevent swarming of bees.
10. How to get maximum honey production.
11. Know when and how to take honey combs from beehives.
12. How to extract honey.
13. How to store honey.
14. How to pack honey for marketing.
15. How to market honey.

Fruit and Vegetable Preservation :

1. How to select and purchase fruits and vegetables for preservation.
2. How to weigh fruits and vegetables and materials used in preservation.
3. How to wash and clean fruits and vegetables for preservation.
4. How to select, use and maintain fruit and vegetable preservation equipment.



5. Know where to obtain equipment and preservatives.
6. How to preserve juices.
7. How to make jams and jellies.
8. How to make acharas.
9. How to make murabbah or preserves.
10. How to make chatanies.
11. How to can fruits and vegetables.
12. How to dry fruits and vegetables.
13. How to prepare ketchup.
14. How to select the kind and amount of preservatives to be used.
15. How to pack, store and market the preserved produce.
16. How to calculate the cost of production.
17. How to determine market value of the product.
18. How to utilize waste products of preservation.
19. How to determine if products are adulterated.

Seed Production :

1. How to determine if seed production is profitable for a specific farm.
2. Know what factors should be considered in deciding to produce seed.
3. How to prepare the field for seed production.
4. How to apply manure and fertilizer to the field.
5. How to select and obtain foundation seed.
6. How to sow certified seed.
7. How to do interculture.
8. How to irrigate hybrid plants.
9. How to produce pure hybrid seed.
10. How to produce open-pollinated seed.
11. How to determine seed purity.
12. How to inspect standing seed crops:
13. How to harvest seed.
14. How to pack seed for shipment.
15. How to market hybrid seed.
16. How to determine cost of production per unit of hybrid seed.

Nursery Raising :

1. How to determine if nursery raising is profitable for a farm.
2. How to lay out the nursery.
3. How to prepare the nursery bed.
4. How to select good stock.
5. How to raise good stock.
6. How to select good scions.
7. How and where to purchase scions.
8. How to identify and control insects, pestes and diseases in the nursery.
9. How to lift and pack the seedlings and plants.
10. How to transport plants and seedlings.
11. How to market nursery stock.

Floriculture :

1. How to determine if flower production is profitable for a farm.
2. How to raise flower seedlings.
3. How to select the best soil for seedlings.
4. How to prepare seedbeds for the plants.
5. How to properly apply manure.
6. How and when to do transplanting.
7. How and when to water.
8. How and when to do pruning of perennials.
9. How and when to collect seeds of flowering plants.
10. How to pot a plant.
11. How to produce summer and rainy season plants.
12. How to produce winter seasonal flowering plants.
13. How to produce perennials.
14. How to care for flowering trees and non-flowering trees.
15. How to prepare flower for marketing.
16. How to market plants and cut flowers.

Fishery :

1. How to decide if a fishery is economical for a situation.
2. How to select the kind of fish for a fishery.
3. How to obtain stock fish.
4. How to select, maintain and use fishery equipment.
5. How to employ various methods of rearing fishes.
6. How to properly feed and water fishes.
7. How to catch fish.
8. How to identify, control and/or prevent diseases and enemies of fish.
9. How to preserve fish.
10. How to market fish.

Biological Principles :

1. Animal nutrition.
2. Plant nutrition.
3. Photosynthesis.
4. Reproduction.
5. Germination of seeds.
6. Transpiration.
7. Genetics.
8. Growth.
9. Diffusion.
10. Matter and energy.
11. Respiration.
12. Living matter.
13. Regulators of plants growth.
14. Movement of substances in living organisms.

Mathematical Principles :

1. Addition.
2. Subtraction.
3. Multiplication.
4. Division.

Science and Physics Principles :

1. Conductivity.
2. Levers.
3. Elasticity.
4. Friction.
5. Gravity.
6. Insulation.
7. Light.
8. Motion.
9. Pressure.
10. Radiation.
11. Heat and Temperature.
12. Magnetism.
13. Combustion.

Chemistry Principles :

1. Acids and bases.
2. Adsorption.
3. Crystallisation.
4. Density.
5. Gases.
6. Hormones.
7. Melting Point.
8. Oxidation, rusting.
9. Permeability.
10. Solubility.
11. Viscosity.

Language Principles :

1. Sentence structure.
2. Spelling.
3. Parts of speech in ordinary usage.
4. Punctuation in ordinary usage.
5. Letter writing.
6. Paragraphs.
7. Vocabulary.

APPENDIX VII
HOME PROJECTS
IN
AGRICULTURE
*DEMONSTRATION MULTIPURPOSE HIGHER
SECONDARY SCHOOL
REGIONAL COLLEGE OF EDUCATION, AJMER,
RAJASTHAN*

What is a Supervised Home Project in Agriculture ?

Perhaps the definition of a supervised home project in agriculture can be summed up in this statement : "Supervised home projects consist of all the farming activities of educational value conducted by students enrolled in agriculture and for which systematic instruction and supervision are provided by the teacher."

To put the definition on specific terms, a student in agriculture has twenty chickens at his home. All the plans and procedures for obtaining the chickens and earning from them are the responsibility of the student under the supervision of the teacher of agriculture. Classroom instruction is planned in such a way as to provide the student with practical knowledge in poultry raising. The student puts the knowledge to a practical use in his home project.

These are our objectives for Home Projects :

- (a) The agriculture teacher can follow-up his classroom teaching to the home farms of students where they live and work.
- (b) The teacher can help create situation at the student's farm where the latter can apply some of the theories taught in the class.
- (c) The student can be helped in removing his difficulties in his thinking that will keep him from following an improved practice.
- (d) Through contacts with students and parents, a healthy relationship between the school and the homes can be built.

- (e) The teacher can help develop in students an appreciation for scientific methods in farming and the importance of "learning by doing".
- (f) The home project provides an important basis for evaluating the effectiveness of instruction in agriculture.
- (g) The home project will help a boy become established in farming or in another agricultural occupation.
- (h) The student will develop abilities to earn, save and use money wisely.

This is How We Start a Home Project ?

For the home project to be a success, the teacher of agriculture must believe that the home project is necessary in order that the student can "learn through experience". The teacher must first believe that the home project will enable the student to develop abilities which will help him become established in farming or in a related agricultural occupation.

In the classroom, the teacher guides the student in developing an understanding of his needs, what it takes to become established in farming and other agricultural occupations, and the type of home project that will best meet the student's particular situation.

The next step for the teacher in establishing a home project is to develop understandings with all persons concerned with the student's project programme. At this point, the importance of visiting the home of the student cannot be overemphasized. During the visit, the teacher must fully explain the supervised home project programme to the parents. This helps the parents to understand the responsibilities that each of the parties—student, parents, teacher—must carry out during the duration of the home project. If this is not done, chances are the home project will not succeed.

After all persons involved understand their responsibilities, the teacher and student make their plans for starting the home project. These plans may include : (a) What vegetables to plant ? (b) Where shall I have the garden ? (c) How many chicks can I house in this room ? (d) When shall we purchase the chicks at the Government Poultry Farm ? (e) Where shall I purchase my seed ?

It is the responsibility of the teacher to make sure that sound plans are made, that quality seed and animals are purchased, that modern and scientific approved practices are recommended and followed, and that sound financial procedures are recommended and followed, and that accurate and complete records of the project are kept by the student.

Even though the project has been started on a sound basis, the teacher's job is not finished. He must continue to visit the boy's home to see that the recommended practices are being followed. During the visit he must check for diseases and insects or any other problems of the project. The teacher also has an opportunity to encourage the student and the parents and to develop cooperative teacher-parent-student relationships.

This was Our Plan :

The principal idea in starting the home projects programme was to provide the students with comprehensive work-experiences necessary to help them become more efficient in their farming.

A large amount of thinking and planning had to be done before projects could be identified and distributed among the students. Most of these students had very little rural background nor had they any land to work on. The home project programme had, therefore, to be geared to the needs and resources available with these urban boys.

To begin with, only two enterprises, Poultry and Growing Pusa Gaant Hybrid Napier grass as fodder for the dairy animals, were started. The success achieved in these projects was quite heartening as was evident from the response the projects received from both the students and their parents. The school department of agriculture had therefore to expand the scope of these activities and include such other enterprises as would meet the needs of more and more students.

These are the Results :

Today, the school department of agriculture is conducting home projects on the farms/home premises of nearly 34 students from all grades. The important enterprises included in the programme are :

- (a) Poultry.
- (b) Vegetable gardening.
- (c) Growing maize for table purposes.
- (d) Growing hybrid napier grass as fodder.
- (e) Flower gardening.

The students are required to involve themselves in all phases of operations of the farming projects including selection, planning, conduction and evaluating the projects. They carry out all the operations by themselves and maintain up-to-date records of all the operations and the expenses incurred on them. They also keep a record of all important observations and experiences.

All these students work under the guidance and supervision of the agriculture teacher. The agriculture teacher visits the students' home premises/farms and helps them solve any difficulties. He also checks their records. He holds conferences with the parents and discusses the ways and means to improve and strengthen the programme. To the agriculture teacher the home projects programme is very useful as it helps him to achieve some important objectives of agriculture education at the school level.

This is How We Evaluate :

A teacher of agriculture evaluates the success of the home project in several ways. During his supervisory visit to the student's home and farm, the teacher observes how well the student is applying improved practices learned in the classroom. Also, after the project has been completed, the teacher can compare the results of the project (yield per acre, number of eggs per hen, pounds of milk per cow per year, etc.) with recommended standards of production. Although most as easy to evaluate as yield per acre, the relationship of the student, teacher and parents plus the student's attitudes towards school can be evaluated. In all these respects the home project scheme is growing on well in the school.

Shri S. P. Singh, Teacher of Agriculture,
Shri V. C. Kimothi, Teacher of Agriculture,
Shri E. E. D'Rozario, Headmaster.

APPENDIX VIII
CROP ENTERPRISE RECORD
for
Secondary School Students in Agriculture

Developed and Printed
by
The Regional Colleges of Education
and
The Ohio State University Education Faculty in India
November 1966

Name of Student _____ Age _____

Class _____ School Year _____

Crop _____ Season _____ Acres _____

Starting Date _____ Closing _____ Date _____

Checked and Approved by _____ Teacher. Date _____

CROP ENTERPRISE AGREEMENT

Under each paragraph heading state all points so clearly that there will be a full and complete understanding among all parties. Be sure to have all items in the budget in agreement with the items on this page.

Be definite in stating what part or share of each item of the production cost will be furnished by each party. "Furnish" means to be financially responsible regardless of the source from which the items originate. In describing how the returns will be divided, state the shares in terms of production or sales, as is done when a crop is shared. Later changes in the agreement must be agreed upon by all parties and recorded on this page.

1. Kind, size, duration and location of the enterprise :

2. What the other party will furnish :

3. What the other party will furnish :

4. What returns the student will receive :

5. What returns the other party will receive :

Signed _____

Student

Signed _____

Other party

Approved _____

Other party

Approved _____

Agriculture Teacher

BUDGET FOR CROP ENTERPRISE

The budget is an estimate of all costs and returns anticipated during the production of the crop. It should be developed before the enterprise begins in order to serve as a guide to financial planning. Sources of information such as local prices, government statistics, experimental data and other available information may be used in the development of the budget.

PRODUCTION

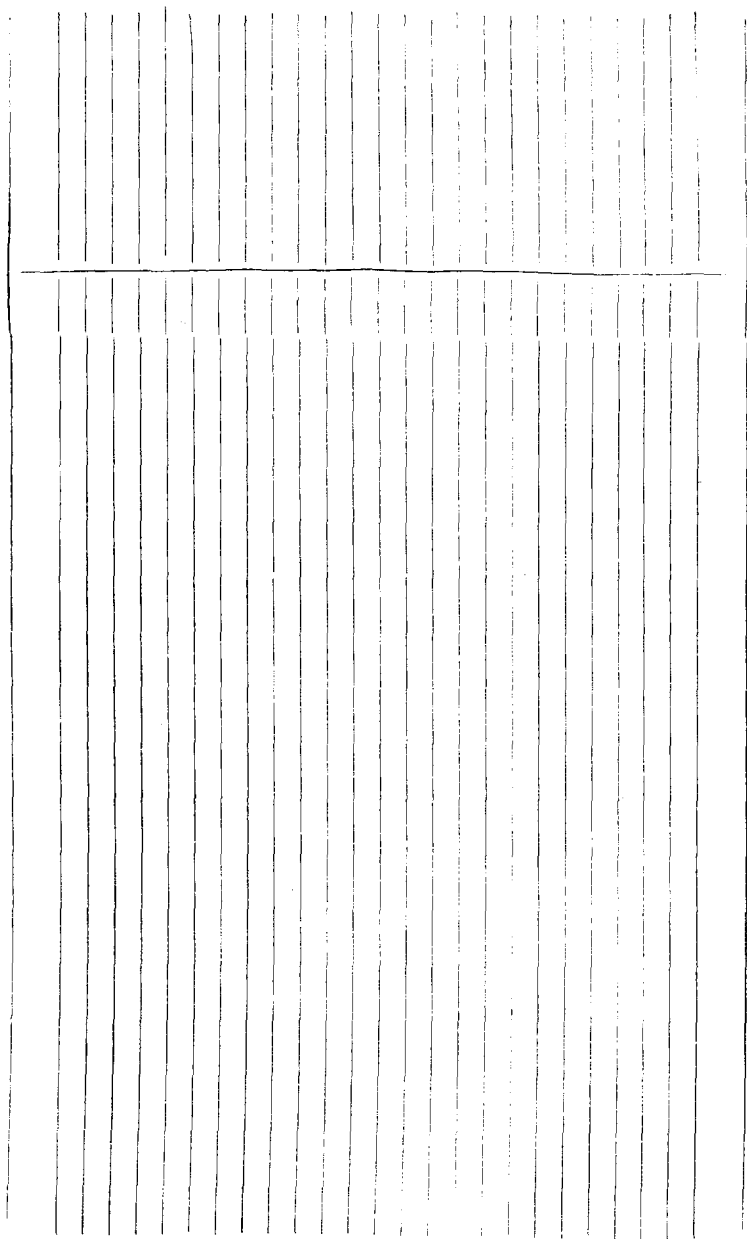
CROP _____ ACRES _____ PERIOD _____ 19__ to _____ 19__

ESTIMATED RETURNS

Description	Quantity	Price Per Unit		Total Value		Student		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.
Closing Inventory									
Crop Products Sold or Used									
Straw, Fodder									
Other Products									
(A) TOTAL ESTIMATED RETURNS									

ESTIMATED EXPENSES

Description	Quantity	Price Per Unit		Total Value		Student		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.
Beginning Inventory									
Use of Land									
Seed, Seedlings									
Fertiliser									
Manure, Compost									
Seed Treatment, Sprays, Dusts									
Machinery and Equipment									
Irrigation									
Other Costs									
(B) TOTAL ESTIMATED EXPENSES									
(C) TOTAL ESTIMATED LABOUR AND MANAGEMENT INCOME (A minus B)									



INVENTORIES OF CROP ENTERPRISE

The beginning inventory is used only for perennial crops, such as fruit trees, etc. Supplies on hand before the start of an annual crop should be entered on the supplies page as they are used. Include all items in the closing inventory which have not been sold or used before the time for closing the inventory.

BEGINNING INVENTORY

Description	Quantity	Price Per Unit		Total Value		Student Share	
		Rs.	P.	Rs.	P.	Rs.	P.
(A) Total Beginning Inventory							

CLOSING INVENTORY

Description	Quantity	Price Per Unit		Total Value		Student Share	
		Rs.	P.	Rs.	P.	Rs.	P.
(B) Total Closing Inventory							
(C) Increase in Inventory (B minus A)							
(D) Decrease in Inventory (A minus B)							

RECORD OF LABOUR AND MACHINERY

Enter all the labour and machinery for the crop in this record using a separate line for each major job. Unpaid labour and machinery includes any which is furnished by the home farm and for which no payment is made. Machinery or labour which is actually hired should be entered in the paid machinery and paid labour columns. Any costs actually paid by the student should be entered in the last column.

Date	Kind of Work	Hours of Unpaid Labour	Hours of Unpaid Machinery	Hours of Paid Labour	Value of Paid Labour		Hours of Paid Machinery	Value of Paid Machinery		Student Share of Cost	
					Rs.	P.		Rs.	P.	Rs.	P.
TOTAL		A			B			C			

RAINFALL AND IRRIGATION RECORD

Enter quantities of which have been applied to the field (rainfall and irrigation) from the time of seedbed preparation until the time of harvest. Use a separate line for each date that water is applied. Record the quantities of water in centimetres per acre. Enter all the costs of irrigation, including the cost of water, power and machinery, and any paid labour. Any share of the cost furnished by the student should be entered in the last column.

Date	CENTIMETRES OF WATER APPLIED PER ACRE		COST OF IRRIGATION			
	Rainfall	Irrigation	Total		Student Share	
			Rs.	P.	Rs.	P.
TOTAL						

SUPPLIES AND MISCELLANEOUS COSTS

This record includes all operating expenses other than for irrigation, labour and machinery. Enter seed, fertiliser, compost, sprays, dusts and other supplies used. The charge for use of land should include costs of taxes, fencing and a reasonable charge based upon the value of the land. Enter the actual amount paid to the landlord if the land is leased.

Date	Description	Quantity	Price per Unit		Total Value		Student Share	
			Rs.	P.	Rs.	P.	Rs.	P.
	Use of Land							
TOTAL.....								

CROP PRODUCTS SOLD OR USED AT HOME

Enter the total value of those products which are sold. Commission marketing costs or other deductions from the total value should be entered on page 7. Products used at home should be entered according to current market value at the time used. Products stored for future use or sale should be entered in the closing inventory page 2 and not in this record.

Date	Description	Quantity	Price per Unit		Total Value		Student Share	
			Rs.	P.	Rs.	P.	Rs.	P.
TOTAL CROP PRODUCTS.....								

SUMMARY OF CROP ENTERPRISE

RETURNS							
Description	Quantity	Total Value		Student Share		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.
Increase in Inventory (Page 5) item C							
Crop products sold or used at home (Page 6)							
Other							
(A) TOTAL ENTERPRISE RETURNS							

EXPENSES							
Description	Quantity	Total Value		Student Share		Other Party	
		Rs.	P.	Rs.	P.		P.
Decrease in Inventory (Page 5) Item D							
Paid Labour (Page 7) B							
Paid Machinery (Page 7) C							
Irrigation Costs (Page 8)							
Supplies and other Costs (Page 9)							
(B) TOTAL ENTERPRISE EXPENSES							
(C) TOTAL LABOUR AND MANAGEMENT INCOME (A minus B)							

ANALYSIS OF CROP ENTERPRISE		
	Total	Unit
Yield (Main product)		
Value marketed or inventoried (Main product)		
Cost of production of main product		
Labour and management income (Unit=Acre)		
Labour and management income per hour of unpaid labour (C page 10 ÷ by A page 7)	* * *	

ANALYSIS OF CROP ENTERPRISE (Continued)

Kind of crop _____

Acres grown _____

Season _____

Location (District and State) _____

Soil type _____

Soil analysis (Nitrogen) _____

(Phosphorous) _____

(Potassium) _____

Variety of seeds (seedlings) _____

Amount of seed (seedlings) per acre _____

Seed treatment used _____

Date of planting _____

Method of planting _____

Total number of days from planting to harvest _____

Pounds of fertiliser applied per acre _____

Analysis of fertiliser used _____

Pounds of manure and compost per acre _____

Plant nutrients added (Nitrogen) _____

(Phosphorous) _____

(Potassium) _____

Centimetres of irrigation water per acre _____

Centimetres of rainfall per acre _____

Disposal of main product (sold, stored) _____

Other comments _____

APPENDIX IX
LIVESTOCK ENTERPRISE RECORD
for
Secondary School Students in Agriculture

Developed and Printed
by
The Regional Colleges of Education
and
The Ohio State University Education Faculty in India
November 1966

Name of Student.....Age.....

Class.....School Year.....

Livestock.....

Starting Date.....Closing Date.....

Checked and Approved by.....Teacher. Date.....

LIVESTOCK ENTERPRISE AGREEMENT

Under each paragraph heading state all points so clearly that there will be a full and complete understanding among all parties. Be sure to have all items in the budget in agreement with the items on this page.

Be definite in stating what part or share of each item of the production costs will be furnished by each party. "Furnish" means to be financially responsible, regardless of the source from which the items originate. In describing how the returns will be divided, state the shares in items of production or sales, as is done when livestock is shared or rented. Later changes in the agreement must be agreed upon by all parties and recorded on this page.

1. Kind, size, duration and location of the enterprise :

2. What the student will furnish :

3. What the other party will furnish :

4. What returns the student will receive :

5. What returns the other party will receive :

Signed.....
Student

Signed.....
Other Party

Approved.....
Other Party

Approved... ..
Agriculture Teacher

BUDGET FOR LIVESTOCK

In making this budget, use amounts and prices based on enterprise records, experimental data, and agricultural forecasts. Use this budget as a guide in developing an enterprise agreement which will be fair to both parties, and to determine the amount of cash, feed, supplies, etc. needed to carry out the enterprise.

NO. AND KIND OF ANIMALS _____ PRODUCTION PERIOD _____ 19____ to _____ 19____

ESTIMATED RETURNS

Description	Number Amount	Price Per Unit		Total Value		Student		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.
Animals produced									
Animal products									
Original producing animals									
Value of manure									
(A) TOTAL ESTIMATED RETURNS									

ESTIMATED EXPENSES

Description	Number Amount	Price Per Unit		Total Value		Student		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.	Rs.	P.
Animals									
Use of Building & Equipment									
Grain									
Supplement									
Hay									
Pasture									
Breeding & Veteri- nary fees									
Other									
(B) TOTAL ESTIMATED EXPENSES									
(C) TOTAL ESTIMATED LABOR AND MANAGEMENT INCOME (A minus B)									

GOALS AND ACHIEVEMENTS

Goals should be developed before the enterprise begins and should be based upon the budget. They should be stated clearly and simply and be challenging, attainable and measurable. Achievements should be entered as they are determined throughout the crop production cycle.

Goals	Achievements

59

APPROVED PRACTICES

The approved practices to be carried out in the enterprise should result from instruction in agriculture. They should be listed in a logical sequence, beginning with preparation of the seedbed and continue through harvesting, storing and marketing. Enter the date on which each practice is completed in the appropriate column.

Practice	Date completed

INVENTORIES OF LIVESTOCK ENTERPRISE

The beginning and additional inventories are used only for those items on hand or added to the project which are not consumable and are used in production. Include all items in the closing inventory which have not been sold or used before the time for closing the inventory.

BEGINNING AND ADDITIONAL INVENTORIES

Date	Description	Number, Amount	Price Per Unit		Total Value		Student Share	
			Rs.	P.	Rs.	P.	Rs.	P.
(A) Total Beginning and Additional Inventory								

CLOSING INVENTORY

Date	Description	Number, Amount	Price Per Unit		Total Value		Student Share	
			Rs.	P.	Rs.	P.	Rs.	P.
(B) Total Closing Inventory								
(C) Increase in Inventory (B minus A)								
(D) Decrease in Inventory (A minus B)								

SUMMARY OF LIVESTOCK ENTERPRISE

RETURNS							
Description	Quantity	Total Value		Student Share		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.
Increase in Inventory (Page 5) item 6							
Livestock sold or used at home (Page 6)							
Livestock products sold or used at home (Page 6)							
Other							
(A) TOTAL ENTERPRISE RETURNS							

EXPENSES							
Description	Quantity	Total value		Student Share		Other Party	
		Rs.	P.	Rs.	P.	Rs.	P.
Decrease in Inventory (Page 5) item 13							
Feed Costs (Page 7)							
Total other costs (Page 9)							
Other							
(B) TOTAL ENTERPRISES EXPENSES							
(C) TOTAL LABOUR AND MANAGEMENT INCOME (A minus B)							

ANALYSIS OF LIVESTOCK ENTERPRISE

Date Project Started _____ Date Project Closed _____ Total Days _____
 Kind _____ Breed _____
 Number Started (Page 5) _____ Number Raised _____
 Mortality—Number _____ Percent _____
 Kind of Feeds Fed (Concentrates) _____
 (Roughages) _____
 Analysis of Main Concentrate % Protein _____ T.D.N. _____ Fiber _____

ANALYSIS OF LIVESTOCK ENTERPRISE (contd.)

	Total	Unit
1. Production of Main Product (Meat, Milk, Eggs, etc.)	-----	-----
2. Value of Production	-----	-----
3. Costs of Production	-----	-----
4. Feed Cost	-----	-----
5. Costs other than feed	-----	-----
6. Labour and Management Income	-----	-----
7. Amount of Feed fed	-----	-----
8. Feed Conversion (No. 7 \div by No. 1)	-----	$\times \times \times$
9. -----	-----	-----
10. -----	-----	-----

Special Practices that seemed to be very beneficial .

WHAT CHANGES NEED TO BE MADE TO IMPROVE THIS PROJECT?

(To be completed by student)

APPENDIX X

FFI

FUTURE FARMERS OF INDIA

Demonstration Multipurpose Higher Secondary School,
Regional College of Education, Ajmer, Rajasthan

THE FUTURE FARMERS OF INDIA

The Future Farmers of India is the organization of, by and for students studying agriculture in the higher secondary schools. It is an educational, non-political youth organization of voluntary membership, designed to develop agricultural leadership, character, thrift, scholarship, cooperation, citizenship and patriotism. Students must be enrolled in agriculture to become eligible for membership.

THE FFI MOTTO

*“Learning to do,
Doing to learn,
Earning to live,
Living to serve.”*

Learning to Do.—(As vocational agriculture students in high school, Future Farmers study the economic and scientific principles of agriculture and learn skills needed on the farm and in other agricultural occupations).

Doing To Learn.—(Each member is urged to conduct a farming program at home or on another farm, under the supervision of his vocational agriculture instructor. The student thus gets practical experience to supplement his study).

Earning to Live.—(The supervised farming program at home is designed to operate at a profit so that the Future Farmer may expand his farming enterprises as he learns, to the end that he will be successfully established in farming or in a related agricultural occupation, and become a self-supporting substantial citizen).

Living to Serve.—(Development of competent, aggressive rural leadership and citizenship is a primary aim of the FFI; practical experiences in parliamentary procedure, committee work, and conducting other business of an organization are provided through regular meetings. Cooperation with other groups, and the assumption of community responsibilities are taught through community service activities).

AIM AND PURPOSES OF THE FFI

The primary aim of the Future Farmers of India is the development of agricultural leadership, cooperation and citizenship. The purposes for which this organization was formed are as follows :

1. To develop competent, aggressive, rural and agricultural leadership.
2. To inculcate and nurture a love of country life.
3. To build up the confidence of farm boys and young men in themselves and their work.
4. To create more interest in the intelligent choice of agricultural occupations.
5. To encourage members in the development of individual farming programs and establishment in farming.
6. To encourage members to improve the farm home and its surroundings.
7. To participate in worthy undertakings for the improvement of agriculture.
8. To develop character, train for useful citizenship and foster patriotism.
9. To participate in cooperative effort.
10. To encourage and practice thrift.
11. To encourage improvement in scholarship.
12. To provide and encourage the development of organized rural recreational activities.

The advisors of the Ajmer FFI organization are :—

1. S. P. Singh, *Teacher of Agriculture, Demonstration School.*
2. V. C. Kimothi, *Teacher of Agriculture, Demonstration School.*
3. Lowell E. Hedges, *U. S. Consultant in Agriculture.*

Any questions concerning the FFI organisation may be directed to any one of the above, or to the following persons :

- R. P. Singh, *Reader and Head of Agric. Ed., Dept., R.C.E.*
 V. E. D'Rozario, *Headmaster, Demonstration School.*
 J. K. Shukla, *Principal, Regional College of Ed.*

