AGRICULTURAL EDUCATION
FOR
REGIONAL DEVELOPMENT AND SELF-EMPLOYMENT

1989
UNIVERSITY OF AGRICULTURAL SCIENCES
BANGALORE
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FOR
REGIONAL DEVELOPMENT AND SELF-EMPLOYMENT
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on Nov. 12-13, 1987

SILVER JUBILEE YEAR
1964-1989

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UNIVERSITY OF AGRICULTURAL SCIENCES
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FOREWORD

Agriculture Education in India took a definite shape with the starting of many Agricultural Universities in the country, a quarter of a century back. These rural universities were charged with the responsibilities of carrying out the three-fold functions of teaching, research and extension. Of course, in a country like India, agricultural education of right kind is indispensable for economic progress; it should meet the emerging demands of modernisation of agriculture and facilitate rural development through agriculture and self-employment. But, at present the environment in which the agricultural education is being imparted to the students in the suburban based Agricultural Universities, is not adequately rural biased. In addition, there is large scale migration of youth from rural areas to urban areas seeking employment and better life. This is an undesirable trend which need to be checked through rural-oriented and self-employment orientated education. Therefore, there is a need to reorient and reconstruct agricultural education system to promote regional development and self-employment; the ruralisation of higher agricultural education is required more at this juncture than ever.

Ruralisation of higher education should imbibe rural character to the agricultural education so that the graduates who come out of the system will have not only the needed professional competency but also the right perspective and favourable attitude towards self-employment on their own farms. The objective of ruralisation of agricultural education should be to start colleges in rural areas to improve the general standard of agriculture, resulting in steady regional development and opening avenues for self-employment in agriculture and allied fields.

In this background, a National Seminar on 'Agricultural Education for Regional Development and Self-employment'
was organised by the University of Agricultural Sciences, Bangalore in order to make suggestions for reorienting agricultural education system, to promote regional development and self-employment. Renowned agricultural scientists from all over India, policy makers, extension functionaries and farm leaders participated in the seminar and deliberated all dimensions of agricultural education viz. agricultural education at different levels, agricultural polytechnics, ruralisation of agricultural education, practicals for inducting better work experience, distance education, self-employment for agricultural graduates and mobilisation of financial resources. Several recommendations emerged out of these deliberations in the seminar. along with the seminar papers and theme papers are presented in this publication.

I am sure that this publication brought out during the Silver Jubilee Celebrations of this university will be of value to the agricultural educationists and policy makers in the country in formulating strategies to make agricultural education more purposeful and productive.

I appreciate the efforts put forth by Dr. K.M. Jayaramaiah, Professor and Head, Department of Agricultural Extension and convenor of the seminar for editing this publication; and Prof. K. R. Ganapathy, Editor, Communication Centre, for causing its early publication.

K. Krishnamurthy
Vice-Chancellor

Bangalore 1989
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CHALLENGE OF EDUCATION - A POLICY PERSPECTIVE
WITH RESPECT TO AGRICULTURAL EDUCATION

C. P. GHONSIKAR*

Education has always acquired an honoured place in human society. It is considered to be one of the most important activities of human life from its birth and is a determining factor to shape the destiny of an individual, community, society and nation as a whole. Education system must build-up confidence and renovate energies to meet challenges of its time. Educating people is like elevating the levels of the welfare of the humanity. Thus it influences greatly the human life in an endeavour to eliminate ignorance, poverty and miseries of social evils. It indirectly helps to build an improved economic order with their responsible political structure in the nation.

Agriculture has been always the mainstay of Indian civilization. The prosperity of the nation since ages has been closely associated with an agricultural growth and this holds true particularly, to India Post-independence era has emphasised expansion and improvement in agricultural growth. University Education Commission headed by late Dr. Radhakrishnan in 1948 suggested the establishment of Rural University (R.U.) with a view to link programme of Agricultural Education with the production programme. This approach has lead to the establishment of Agricultural Universities in India. The nation wide debate has been initiated now to evolve a new educational policy. At present agricultural education has remained at University levels, very little of it being imparted at the primary and secondary school level. It has been time and again insisted that since agriculture is an important component of Indian economy, practical trainings

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and the vertical knowledge should be introduced at early stage of education. Keeping this in view, this paper presents a new structure of education for Agriculture, wherein emphasis has been laid to introduce agricultural subjects at primary, pre-secondary stage and further expanding into University structure.

The structural pattern for introduction of agriculture in general education system starting from primary level to University level is proposed as under:

**I to IV Standard**

Agricultural Farm life—Knowledge and information in this area be introduced in the subject of community living, as part of its syllabus. It should contain information on crops, soils, forestry, ecology and natural resources. Inclusion of agricultural knowledge as a part curriculum for I to IV Standards shall enlarge the faculties of primary students, to understand the importance of agriculture in the development of the nation since agriculture is the surrounding environment of every one.

**V to VII Standards**

Agriculture should be introduced as compulsory subject along with Languages (3) Mathematics, General Science and History Geography, Civics. For this purpose, the General Science subject may be divided into two parts:

i. General Science

ii. Agriculture (which will have equal weightage).

The syllabus proposed should cover the areas of Crop Production, Crop Protection, Soil and Water Management, Farm Forestry, Animal Husbandry and Dairying, Ecology etc. The object of introducing agriculture at this stage is basically to acquaint the students about statistics and information on agriculture and animal wealth in India. The students of this level will understand the enormous resources of agriculture
and importance of their management for human development. Agriculture is primarily a biological science and therefore its knowledge is a necessity as a part of general science subject at this level.

The provision for developing those who are not in a condition to continue the education is also proposed through short terminal vocational courses, such as Poultry management, Sericulture, Piggery, Kitchen gardening, Mushroom production, Nursery management, Farm machinery, etc.

VIII to X Standards

Introduction of agriculture as a special flow, on par with the existing technical flow from VIII to X Standards is stressed. The students opting for agriculture will have direct scope for self gainful employment as well as for vertical growth by joining the degree programmes through Agricultural Polytechnics or through X and XI Standards. The agriculture flow at secondary level shall give full opportunity to both who are likely to discontinue the education or those who would like to move forward in higher education. The students particularly in rural areas will be benefitted since they can be absorbed in rural self-employment programmes; agriculture flow will benefit a larger section of secondary school drop-outs.

The post S.S.C. students can also join Agricultural Polytechnic Diploma course which will be of 3 years duration wherein all the agricultural subjects and technology will be covered in the syllabus. The full skilled syllabus will be developed with greater thinking in order to develop middle level technical man power. The middle level technical man power can be employed in service sectors like T & V, or as Lab Technicians in the University education and as Instructors in Vocational courses and in Krishi Vignana Kendras. Similarly, Diploma holders will also have opportunity to join higher education at the second year of the four year degree course in Agriculture and allied sciences.
XI and XII Standards

Present structure of Science education shall be maintained and strengthened with a revised syllabus on agricultural education. The full skill syllabus shall be developed for internal evaluation at XI level and for Board evaluation at XII Standard. Students with agriculture subject shall have weightage for purposes of admission to the degree courses in the faculty of agriculture.

DISTANCE EDUCATION IN AGRICULTURE

There is a need to strengthen Distance Education and make it the bulk work of new higher education policy. It can be used to serve not only the formal need of degrees, but also of real professional and semi-professional requirements. It can also be moulded to instil the concept of learning for its own sake rather than for the sake of job. Such a concept very rightly has been induced in what is called “Open University”. However, in Agricultural Sector, advanced education is a means for developing technical literacy in the rural area where farmers can be acquainted with skills and technology of latest origin, for increasing agricultural productivity and efficient management resources. This can be done by writing, correspondence courses or by making use of electronic and mass media, Video-tapes, Cassettes and T.V. Distance Education will be of special use to farming community of the country; this will be of greater service in educating the illiterate persons with specific agricultural technology. Distance Education can become powerful tool in respect of non-formal education, and in up-dating skilled knowledge. This will help as a two way policy of linking formal education structure with employment to literates on one hand, and promoting human resource development on the other.

The comprehensive structural model of agricultural education in its entirety is illustrated as follows in order to help understand linkages of education to employment and literacy.
NEW AGRICULTURAL EDUCATION PROGRAMME

**School Education**

A. I to IV Standard : Farm life as informative syllabus of community living.
B. V to VII Standard : Compulsory subject along with others.
C. VII to X Standard : Special skill vocation (terminal courses for self-employment).
D. XI to XII Standard : Agriculture as a special flow like technical subjects.

**Post Secondary Education**

Agricultural Polytechnic diploma
Voluntary courses (terminal low level).

**University Education**

B.Sc. (Agri.)
B.Sc. (Horti)
B.Sc. (Agri. Forestry)
B.Sc. (Agri. Busi. Man.)
B.Sc. (Dairy Science)
B.Sc. (Seed Technology)

E-i Graduate course
Can join II year of four year degree.

E-ii Post-graduate course

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E-iii Ph.D. course (Selective)

E-iv Post-doctorate

F Distance Education (To develop technical literacy)
AGRICULTURAL EDUCATION COURSE CURRICULUM
(Upto PUC level)

K. SHIVASHANKAR and G. V. HAVANAGI

Agricultural Education has paid rich dividends in advanced countries benefitting not only the farmer but also the society as a whole. In India, with 70 per cent of the population being dependent on agriculture for its livelihood, agricultural education should receive prime importance from the school level itself. Research findings from World Bank point out that among the factors that accounted for economic growth, education contributed 11.1 per cent in Asia. Agricultural Education should be reoriented, to meet the challenge of meeting the ever raising demand for food, fodder and other bare necessities of life on the one hand and to provide necessary skills, knowledge and where-withals to the students on the other, to be either self-employed in agriculture and related sciences or being absorbed in suitable jobs. By another 15 years, the presently school going children from rural background at the primary standards will have to either settle in their own farms which have already been fragmented to very small sizes or remain more or less underemployed. Only a small percentage of them can hope to get into higher education and salaried jobs. This situation therefore calls for a thorough examination of the opportunities available for agricultural education from kindergarten to Ph.D level. The University Education Commission, the Kothari Commission and the National Commission on Agriculture have all endorsed the view that agricultural education should be given adequate importance at the pre-degree level and in schools also. The National Policy on Education 1986, highlights the need for...

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significant qualitative and rapid technological change in our education system implying the urgent necessity of reaching the working and rural masses; the strengthening and building of physical infrastructure in schools and emphasising on vocational courses at higher secondary levels. It is thus imperative that agricultural education should be restructured by innovative changes at all levels and especially at the school and pre-degree levels with a three-pronged objective of advancing technological changes at the village-level; improving productivity and gearing up to seek self-employment through transfer of technology, and accelerating the desired social change through Human Resource Development (HRD).

An examination of the avenues available for pursuing agricultural education in the country reveals surprisingly a lack of a broad pyramidal base for agricultural studies, to prepare the students either to take up to private farming after leaving the school premises any time they choose or to prepare well with a sound background for higher learning. From an overview in this respect, three levels of agricultural education can be discerned with no definite linkage from one level to the other. Before any discussion on course curricula pertaining to agricultural education in schools and pre-degree levels can be taken up, it is necessary to briefly highlight the existing situation in this regard.

Agricultural education in India is largely carried out by the 23 Agricultural Universities and some Agricultural Institutes and Faculties affiliated to a few other Universities. These provide a formal education with emphasis on regular course curricula and examination, leading to degrees and PG degrees in agricultural sciences. A turn over of 5000 graduates in agriculture per year is seen. The total requirement of agricultural graduates by 1995 is estimated to be over one lakh.

Apart from these seats of higher learning, courses in agriculture and allied subjects are offered in pre-degree colleges and further down in some schools. In Karnataka, for
instance, a few Junior Colleges have been offering agricultural courses as terminal courses while some multipurpose High Schools are offering courses on agriculture in the 9th and 10th Standards.

Vocational Education offers great scope to many students who have completed their S.S.L.C. but are unable to make up for higher studies in colleges or even in Polytechnics for Diploma courses in distant towns or cities because of economic constraints experienced by their parents. The vocational courses provide training and learning in a variety of subjects and students can choose any one field and study for 2 years. They can look for job opportunities in public and private sectors or go for self-employment. Some could even continue with further higher studies in colleges if their positions improve. Government of India has suggested 112 vocational courses and sanctioned a budget of Rs. 50 crores for monitoring and offering through the State Department of Vocational Education. In Karnataka, 51 vocational courses were introduced during 1977-78. During 1985-86, 138 institutions in 19 districts of the State offered 222 vocational courses with a budget of about Rs. 90 lakhs. The enrollment of students has been about 7000 so far. It is suggested that infrastructure for vocational courses should be such that as to cover at least 10 per cent of higher secondary students by 1990 and about 35-40 per cent by 2000 AD. The list of vocational courses of 2 years duration which are related to agricultural education as offered in Karnataka are presented in Table 1.

Table 1

<table>
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<th>Vocational courses related to Agricultural Sciences as offered in Karnataka [Two years duration]</th>
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There are Agricultural Schools administered by the State Agriculture and other Departments particularly for the sons of farmers for training them in practical agriculture. For instance, there are 21 such Agricultural Schools in Karnataka with an intake capacity of 50 students each who have studied up to 7th Standard. The course is for a duration of 10 months beginning from May every year. The list of courses being taught in these schools is presented in Table 2.

### Table 2

*List of courses being offered in the 21 Agricultural Schools of Karnataka (10 months duration after 7th Std.)*

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<th>Course</th>
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<td>1. Soils</td>
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<td>2. Soil conservation</td>
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<td>3. Agricultural Engineering</td>
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<td>4. Cultivation of crops</td>
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<td>5. Plant Protection</td>
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<tr>
<td>6. Horticulture</td>
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<td>7. Animal Husbandry</td>
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<td>8. Fisheries</td>
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While these schools, Junior Colleges and Agricultural Universities are engaged in educating pupils in a formal system, there are a number of Farmers' Training and Education Centres of the
States and Krishi Vignana Kendra of I.C.A.R., providing the much needed education to farmers. Adult Education has played a big role in recent years, there are over 12,700 adult literacy centres in Karnataka alone. In India, adult education covered a population of over 25 crores of adults during 1983, who have had no formal education earlier. Several organisations like Vidyapeethas partly provide training to adult farmers while Rural Development Training Centres provide specialised training to them. There are also in-service trainings to Gramasevaks, Extension Staff and others.

A few questions pertinent here are: 1) Are these Agricultural Universities, pre-degree colleges, multipurpose schools, vocational institutes and training centres enough to cater to the diversified challenging needs of promoting agriculture to the desired extent? 2) Do they really interact with the felt needs of farming communities and raise the rural population above the poverty line and make them reap the benefits of agricultural education? 3) Are our efforts of educating rural and other people in agriculture equivalent to educating people in other spheres? and 4) Are all the agricultural education programmes integrated meaningfully from school level to the post-graduate levels? and What should be the curricula for agriculture and other allied sciences particularly at schools, pre-degree colleges and in vocational institutes?

The answers are loud and clear. Agricultural Education is not to the trim with an expected 700 million people on the farms and in rural oriented livelihoods by 2000 AD. There is an urgent need to put in more funds, infrastructural facilities and bring intermediate technological agricultural education to the doors of the farmers. In doing so, the whole gamut of course curricula at all stages has to be reoriented. This needs a national debate and everyone concerned in policy making has to weigh the options left for us right now. A suggested scheme for imparting agricultural education is as follows:
Levels

1  5th & 6th Stds  Lessons in History of Agriculture, Crops, Classification, Crop Geography, Agricultural Commodities, Uses.

2  7th & 8th Stds  Separate compulsory subjects in Agriculture including Soils, Crops, Horticulture, Dairying and Fisheries. Syllabus akin to courses in Agril. Schools currently being offered by Karnataka State, Dept. of Agriculture which may be abolished and merged into general education stream.

3  9th & 10th Stds  Besides one subject in general Agriculture being compulsory, any one of the courses in Agril. Sciences be taken as special optional subjects.

4a  Agriculture Polytechnics of 2 years duration at one Polytechnic for every District.

   The currently run vocational courses have to be transferred to these Polytechnics where land, laboratory and teaching infrastructures have to be created so as to provide both theoretical and practical experience to students desiring to get settled on farms.

4b  11th & 12th Stds or PUC  Besides one compulsory course in Agriculture, one out of the four specialised groups should be Agriculture and allied subjects. Those desiring to prosecute degree programmes in Agriculture, Horticulture etc. should have taken this group.
5 4 years Degree programmes in:
  B.Sc (Agri)
  B.Sc(Horti)
  B.Sc(Seed Tech)
  B.Sc(Ag. Mark & Co-op.)
  B.Sc(Dairy Tech)
  B.Sc(Sericulture)
  B.H.Sc., B.F.Sc.,
  B.V.Sc.

Syllabi in each case have to be reoriented by deleting several topics in basics and applied aspects covered earlier and by incorporating advanced courses and topics.

6 P.G.Courses leading to M.Sc(Ag) and equivalents To be thoroughly restructured to avoid duplication of courses and research.

7 Doctoral courses

8 Post-doctoral courses

The above scheme envisages giving the right emphasis to agriculture and related fields by integrating the whole system of agricultural education. The acceptance of a common structure of education throughout the country of 10+2+3 systems is helpful in restructuring agricultural education also. The salient points in restructuring the course curricula are:

i) initiation of agricultural courses early in school level itself;

ii) providing agriculture and allied sciences as one compulsory courses and one optional course at the 9th and 10th standards and also at the PUC level so that students entering Agricultural Colleges would be well acquainted with this background material;

iii) Providing some well defined courses so that students can discontinue even at the end of 8th standard, 10th standard or 12th standard or opt for a short period Diploma in Agricultural Polytechnics. This would be in the lines of the recommendations of the Education Commission and of the Committee on restructuring of the
Agricultural Education System in Karnataka, headed by Dr. G.V.K. Rao. This Committee recommends setting up of an Agricultural Polytechnic in every district of the State by amalgamating the existing rural development training centres, agricultural schools etc., to provide pro-service training needed by Departmental candidates, to prepare the middle-level technicians and to train unemployed and under-employed rural youth to start small agro-based industrial units. It is thus hoped that an overall development of agricultural education can bring about rapid transformation in the quality of life for our rural masses. This is just a beginning to revitalise our infrastructure, create additional facilities and swing forward boldly.
It has been widely accepted that education is not meant merely to adopt pupils to their society, but also to equip them to alter it. It has to impart skills and ability to innovate and adapt for optimum utilisation of natural resources. Despite a network of over 6.5 lakhs schools and colleges, the employment of over three million teachers and an annual budget of over Rs. 3000 crores, the qualitative and quantitative objectives are inadequately accomplished. Even now, for every three children enrolled in primary school, one other eligible child is left behind. A considerable percentage of enrolment later becomes drop-outs due to obvious reasons.

The document entitled 'Challenge of Education Policy Perspective' was released by Government of India in August 1985 for a national debate. It has rightly identified the maladies confronting our educational system leading to unequal opportunities, production of unemployed and unemployable youth, progressive erosion of social values and culture, lack of linkage between the world of knowledge and the world of working. The ills and distortions that have crept in the field of education many times lead to frustrations and a sort of freezing of creativity among youth, turning their potential to undesirable lines.

Any well conceived learning situation should satisfy three major domains namely cognitive, affective and psychomotor
domains, as suggested by Bloom (1956). Very often, the cognitive domain, which deals with the recognition of knowledge and development of intellectual abilities, is only taken care of in curriculum planning, leaving behind the affective domain relating to changes of interests, attitudes and values and development of appreciation and adequate adjustment, as well as the psychomotor domain relating to development of motor skills. This could be considered as the prime factor contributing to the tendency of the educated to look down upon agriculture or rural enterprises and their inability to take up some or other production enterprise.

Vocationalisation of lower education

In reorientation of general education system, particularly at primary and secondary emphasis should be given to agriculture and allied subjects to impart vocational skills and to make them receptive to further development messages or technology formulations. Children are to be exposed on how to live in and with their surroundings, in addition to pouring the theoretical formulations of the accumulated knowledge. This learning coupled with confrontation of realities since childhood would necessarily promote self-learning skills and cultivate some entrepreneurial behaviour among them. Such an orientation in the initial years of formal education may help them, in addition to acquisition of some knowledge of natural resources to have a favourable attitude towards self-employment in rural sectors and a sympathy to extension agency efforts.

Necessity of attitude change

Several reports in the field of agricultural extension research have indicated that while studying the levels of aspiration, the farmers generally expressed an antipathy for self-employment of their wards in farming, due to the lower social prestige attached to it. Agriculture many times is considered to be an occupation for the uneducated. Studies
have shown that even agricultural graduates generally preferred to be employed in government or private organisations, rather than going for self-employment in farming.

Incorporating agriculture in the lower education curriculum and making the education more practical oriented may help to change this attitude to a considerable extent. This assumption is supported by the 'Theory of induced action and attitude change' suggested by Kelman (1962). He opined that induced action would create occasion for re-examination of attitudes, new information and experiences and then new psychological situation leading to attitude change. Here, induced action means creating a situation that causes the person to take up action step towards an object that he would not otherwise have taken, given the nature of his attitudes.

Agricultural education and transfer of technology

Most of the research studies in the area of adoption of innovations by farmers have indicated that their knowledge level, risk orientation, management orientation and extension orientation significantly influenced the adoption behaviour. Institutional training for farmers are always designed to improve their adoption behaviour by imparting knowledge and skill components of technologies. But quite often, this becomes restricted to specific skills to facilitate specific decisions in their farm operations. The training sessions are generally of short term, location specific, technology specific and product based. This may not be sufficient to make an individual farmer self-motivated, self corrective and self actualised. Agricultural education provided at the lower level classes in schools may put a concrete base in future farmers’ minds to enable them rational in decision making with regard to farming, perceive the specific problems in correct perspective and expose themselves to newer technological options (Rajagopalan, 1986).
A general understanding of the farming situation and practices, in relation to the local surrounding may help the pupils to develop leadership roles in rural areas. They may develop in future as local change agents, who can certainly perform better than employed change agents. This is supported by the evidences from Denmark, where basic level agricultural education is imparted in schools to all youth, who in turn become progressive farmers or catalysts of adoption process. The practical projects interlocked to the curriculum of primary and secondary levels may encourage group thinking, group will and team work among the children, which in future will help them to identify, analyse and approach problems with a broader outlook and co-operative manner.

Towards a new curriculum planning

Some States in India have already introduced agricultural education at high school level as a part of vocationalisation of education. By and large, the curricula in these institutions seem to be unrelated to daily life, activities, interests, needs and economic benefits of the surrounding community. The teachers are also generally not equipped with adequate skill to correlate the course content with immediate environmental needs and resources.

While planning agricultural curriculum for lower level formal education, the technical leadership should be vested on the State Agricultural University. There should be active coordination from the State Department of Agriculture for the implementation of such a programme. Each Regional Research Station should be able to provide technical support to the schools in the region (Swaminathan, 1982).

Agricultural education in schools should thrust upon skill development of the pupils along with other subjects. The curriculum has to contain intrinsic elements of motivation such as approval, recognition and satisfaction, which were identified by Morgan and Clark (1956) as some of the critical factors contributing to creativity of youth.
Different types of practical projects can also be fit into the course curriculum of Agricultural Education at primary and secondary levels.

1. School Projects: Some projects can be initiated in the school such as Result Demonstration of a technology, with the active participation of teachers, and students and co-ordination with State Department of Agriculture and input agencies.

2. Group Projects: Group projects can be assigned to students, allowing them to earn some profit from it. Special awards or recognition to best groups will motivate to perform in a better way, with a high team spirit. Projects such as vegetable production, seed production, broiler poultry, broiler rabbits etc. can be successfully included in this Scheme.

3. Individual Projects: These projects can be assigned to each student, to complete at home, with guidance of teachers. This would help him to assess and plan for his home surrounding. Such projects may be properly rewarded with grace marks and prizes.

In addition, school level competitions may also be conducted in essay writing, elocution etc. on agricultural topics which may encourage the students to gather more information and prepare for such contests.

References
Morgan, J. E. and Clark, R. C., 1956, Motivating Youth through 4-H programme, University of Wisconsin.
Framing syllabus of any subject without reference to the cultural background of a nation will not be possible. India is an Agricultural nation. The contribution of Agriculture to national income is 50 per cent whereas Industries are the major source of national income in advanced countries. But in India prior to the advent of Europeans, Small Scale and Cottage Industries flourished very well. Agriculture is the nucleus around which all other economic activities revolve in India. Hence a knowledge of agriculture is essential for every Indian. Agricultural education can find a place right from the first standard up to the Pre-Degree level. As such a step has not so far been taken. There is an absolute need for introducing Agriculture as one of the subjects. Introduction of Agriculture as a subject in the curriculum will not only just help the rural masses but also will help the urban population in improving the deteriorating ecological balance. Horticulture, Forestry, Floriculture etc., are the various branches of Agriculture, the knowledge of which should be possessed by every Indian citizen irrespective of the place of residence. Every citizen, either directly or indirectly may be in any capacity, has a role to play in the National Life in general and Agriculture in particular.

School going children should be acquainted with Agricultural background of nation right from the day they join the school on attaining 5 years 10 months of age. From I

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standard to IV standard the child can be taught in general and
in simple language about the theoretical aspects of
Agriculture. It can be further improved from V to VII
standards. By the time the child comes to High School,
Horticulture and other allied subjects can be introduced as the
child has already come to understand the concepts. Demon­
strations at all stages should continue as one of the methods
besides teaching, which should be brief, precise and compact.

Introduction of Agriculture and its demonstration can be
started from X standard and onwards till the completion of the
Pre-University course which paves the way for University
Education where specialisation starts on a large scale. Devia­
tion to any branch of study will be systematic, once the student
is familiarised with the background of our normally so far
taught subjects such as languages, Mathematics, Social
Studies and General Science up to the XII Standard or Pre-
University Course or Intermediate class. Agriculture in India
needs to be introduced as a compulsory subject.
PROSPECTS FOR AGRICULTURAL EDUCATION IN RURAL SCHOOLS

G. RAJGURU *

The Vocational Agricultural programme in India needs rapid expansion due to the broadening of the agricultural technology and non farm occupations, requiring knowledge and skill in agriculture. Since very few public schools offer vocational education in agriculture for farming, there remains room for further expansion of this important phase of public school agricultural education.

This education should be extended downward into the middle schools and upward into the Secondary Schools situated in rural areas. These schools should provide agricultural education through Co-ordinators as Consultants, to elementary teachers to assist them in teaching preliminary agriculture to the rural boys and girls. Through establishment of school-land laboratories, imparting knowledge and skills to the rural school boys can be done through the process of learning by doing. In this way agricultural education can be broadened both horizontally and vertically.

Changes in the field of agriculture are occurring rapidly in all dimensions of our society. These changes have created needs for more and different types of agricultural education in the public schools thus demanding for a more technically oriented type of agricultural education for farmers. In future, many of our farmers are required to operate as technicians in their own vocational field. Hence, they must receive techni-
cian level training in agriculture. Since the technological development of agriculture is continuous, the need for formal, systematic farmers’ education is continuously increasing. In the coming years farming is going to be treated as a business which may involve complicated, scientific practices and their management. The soil is rapidly becoming depleted in many areas, many pests have been introduced, production-management and marketing problems are becoming more complex and competition is becoming keener between enterprises. Consequently, the farmer must cope-up with many complex problems in future. He must be able to form judgements, evaluate carefully and arrive at proper conclusions in solving farm problems.

This situation accounts for the upsurge of interest in providing agricultural education at all levels in the public school for everyone. Agricultural courses in a rural community and the teachers of these courses can and should serve many functions. Agricultural courses usually should be the most meaningful and interesting to the rural boys and girls. In this connection, a question for expansion of this type of education may arise in our mind for the reason a large percentage of educated rural boys and girls may migrate to urban communities. A fundamental principle of good education is that education starts where the pupils are. It is difficult or impossible to start elsewhere.

In general a rural boy or girl is surrounded by agricultural activities. Agriculture is the most important ingredient of his or her experience. Most of every days concern of the adults of the rural community are related to agriculture. Agriculture permits the total existence of rural boys and girls—these groups have a dynamic opportunity to engage in farming or a non-farming agricultural occupation, even from their early age. During their pre-school and early elementary school years, they assist in the day-to-day agricultural work of the family.
The study of agriculture may serve several functions for these rural boys and girls. Since the agriculture teacher provides on farm instructions in the school land laboratories, the boys and girls may relate their practical experience to their parents which may indirectly develop a rapport of the adult farmers with that of the agricultural teacher.

Attention in education recently has been centred on the importance of occupation guidance for young people. Agricultural education programmes in schools have certain inherent advantage and opportunities for guidance of rural boys and girls. The teachers because of their back-ground and education, understand the interests, problems and concerns of rural boys and girls. With the increasing number of rural school teachers with back-grounds and interest foreign to agriculture, the teachers of agriculture are often the teachers best qualified to counsel rural boys and girls.

Research studies indicate that if your economy continues to develop in its present direction, the economic opportunities in farming and in non-farm jobs requiring knowledge and skill in agriculture are going to become increasingly attractive. These research studies also indicate that the competition to become established in agriculture, is increasing rapidly. In future, only the best trained and most motivated will be able to survive the competition between enterprises.

Research studies relating to the aspirations of rural boys and girls indicate that many have unrealistic ambitions relating to agriculture. These boys or girls if enrolled in agriculture courses with good teachers, have opportunities for guidance and counselling second to none. They have a chance to assess the opportunities to become established in farming or in a non-farm occupation requiring knowledge and skill in agriculture, and in a professional position in agriculture.
Lastly, agricultural courses in rural schools will serve the society and individuals by guiding in a human and meaningful way, persons out of farming or out of non-farm agricultural occupations who would not for various reasons be successful in these fields. Agricultural courses in rural schools may also serve the society by assisting these boys and girls who are most needed and most likely to be successful in farming and also to prepare themselves adequately in the science of agriculture which may help them in absorbing the fast changing agricultural technology.
VOCATIONAL AGRICULTURE EDUCATION AT SCHOOL LEVEL (Upto 12th Standard)

S. A. KHURAISHI*

There is a need to introduce a successful vocational agricultural education at school level. Some of the points need to be considered by educationists are outlined below:

I. 1. Concept of Vocationalisation in agricultural Education from 1 to 12 Standards:

a) Work Experience (SUPW) programme (1–8 Standard 5+ to 13+)

b) Work Experience (SUPW) programme supported by home-projects (9–12+ Standards) at age 13+ to 17+. At initial stages single home projects (9th & 10th Standards) such as kitchen gardening, pot culture, bee keeping, poultry keeping etc.

c) Regular programmes in agriculture supported by home-projects [11th and 12th Standards] [15+ to 17]. More challenging home projects such as keeping of improved dairy animals, mixed farming, growing of hybrid and improved varieties of crops, sheep rearing, rearing of improved strains of silkworms, preserving and canning of fruits and vegetables.

d) Vocational programmes for dropouts who are in farming but discontinued their formal education [12–17+ years]

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e) Provision for further education after 12th standard vocational programme for selected few and meritorious students for higher education such as B.Sc. (Ag.) and post graduate courses.

II. Skills, attitude and knowledge relevant to employment orientation and economic development:

Skill 1. The student should develop competency in application of package of improved practices for the best performance of the crops and in allied areas.

Skill 2. The students should demonstrate new techniques of economic and productive enterprises in farming such as mixed farming, relay cropping etc.

III. Attitudes and knowledge to employment orientation and economic development

Development of right attitude towards agricultural development and ability to plan and execute for effective use of facilities and resources through proper budgeting.

IV. Apply principles of business education for agriculture for effective production and disposal so as to get maximum economic returns.

Types of courses:

V. 1) Drop-out programmes for self-employment
   2) Regular programme in agriculture with home projects for demonstration school students,
   3) Work experience [SUPW] programmes at different levels related to agriculture.
   4) Programme for young and adult farmers.

VI. The Agencies can undertake many activities:

1) Agricultural Universities:
   a) Vocational programmes in areas (where intensive agricultural development programmes are going on)
such as cultivation of hybrid and improved varieties of crops, relay cropping, mixed farming etc.

b] Programmes can also be taken up in special zones such as mulberry cultivation areas, low rainfall areas where emphasis is on soil and water conservation and on mixed farming, etc.

c] Additional facilities can be provided in the shape of buildings, laboratories, equipments and staff to already existing centres.

2. Agriculture Department:

a] The programmes can be started after surveying the need of the locality and the existing facilities.

b] Research, extension and gram-sevak training centres.

c] Few Vidyapeeths by providing adequate additional facilities.

3. Regional Colleges of Education where leadership is existing by starting pilot projects.

VII. Accreditation Procedures

A Committee consisting of academic staff from the agencies cited above, along with other experts will be incharge of promoting and maintaining high level competencies in the programmes, to ensure vocationalised competencies.

Accreditation Committees will be incharge of establishment of standards, inspection and assessment programming, and evaluation, coordination and monitoring to meet standards, and for liaison with industries etc.

VIII. Coordinating Boards

The Scheme of Examination for Vocational Education has to be specially different from that of academic programmes. It is necessary to depend upon a meaningful and well planned
comprehensive programme of internal assessment supported by assessments by visiting teams of experts consisting of agricultural educationists, who will satisfy themselves with the students' competencies at the terminal stages. This team will function as a Coordinating Board, interviewing selected candidates and giving them specific jobs to do, during their visits.

The Boards should also work in collaboration with the school, District, State and Central levels. This gives an effective and meaningful evaluation of the programme. The programmes should be followed up by one agency at the Central Cell or by the concerned agency at the state to assess the weak and stronger of the programme, and to find the utility of vocationally trained candidates.

IX. Special courses of vocational programmes to be run at already existing National Institutes such as Central Food Technological Research Institute.

In Agro-industry agencies such as poultry feed and livestock feed plants, fertilizer mixing agencies in semi-urban and urban areas, tools and implements manufacturing firms, plant protection industry etc., special courses can be offered. Ultimately the agro-industry has to be one of the main sources of employing the trained vocational students in agriculture who seek employment.

X. Setting up of Vocational Education Wing in these agencies.

a] Setting apart adequate land, buildings, and providing adequate tools and equipments as well as staff for these programmes.

b] Setting up of Co-ordination Committee at National level representing the different agencies.

c] Setting up of Accreditation Committees representing academic staff from different agencies.
XI. Pre-University Vocational Programme in Agriculture

These programmes will incorporate the following principles:

a) Flexibility of duration and competency development

Depending on the competency of candidates Diploma Course could be from 18 months to two years. Some may not be able to complete in 2 years and others may want to develop competency in other fields to some extent, they may be allowed for 3 years.

b) Electives, Integration and Coordination

Vocational courses should provide opportunities to develop competencies in related fields with emphasis on Agricultural Economics. Only 2 to 3 electives may be sufficient. Nearby institutes and related agencies should be tapped for providing practical live experience; Internship may also be insisted.

Special problems

How to ensure success in vocation at Agricultural Education?

The Education Commission has rightly observed that many programmes relating to vocationalisation have failed for a number of causes such as: lack of facilities, lack of adequately trained teachers, insufficiency of funds, not being related to real life situations, the system of examination and evaluation. In addition to the above, there are certain basic reasons for the failure of vocational courses. The approach to vocational education both in instruction as well as evaluation has been almost on the same lines as in academic education—rigid time table, rigid syllabus and rigid programme of work irrespective of individual interests and individual differences is being used.

In vocational education, there must be cent per cent success and not the 35 per cent pass in terms of the skills and understandings.
Hence, a new approach with reference to the educational areas associated with vocational education is now to be developed i.e., the syllabus and time table should be completely flexible to the extent of even catering to each individual in a programme. The component of adequate discussion and sharing of experiences by the students in their practical work be reviewed by the instructor, and experts assessment be in terms of the competencies and skills built by the students and not just the written answers of students.

Vocational Education is usually considered to be of a lower level, and consequently a cheaper form of education by many people. Vocational Education is at least as important if not more than academic education. It is the only education through which the country can build suitable economy in manpower in terms of Agriculture, Technology, etc. And hence the administrators should be willing to bestow more thought and give more funds and facilities to vocational education. If vocational education has to definitely succeed in our country, the best administrators and the highly paid specialists in the field should be encouraged to study the problems and make a success of it within a period of three to five years.
ROLE OF POLYTECHNICS IN AGRICULTURAL EDUCATION

L. SUNDERARAJAN*

The structure of educational system and the pattern of skills generated in any country should reflect the ethos of that country as well as its chief concerns. Indian educational system, however, has been found lacking in this respect by several national leaders, economists and educationists who expressed their concern about it. Gandhiji, for instance, was of the view that in a poor country like India, where 80 per cent of the population dependent on agriculture and another 10 per cent is dependent on industry, it is a sin to give a purely literacy or liberal education. He, therefore, advocated basic education - the work - centered education [Ramanjam et. al., 1977]

The educational system that India has been having is a legacy of the past, "the vestigial remains of colonial regime historically designed to produce clerks" but not the skills that would respond to the growing needs, aspirations and demands of a modernising egalitarian society. For instance, if a farmer’s son is allowed to complete B.A., or M.A., he will be rendered unfit for farming. For, he will go in mostly for a white collar job which is in short supply. The present educational system is thus anti-national and damages the very structure of national economy.

Reconstruction of education

Realising the gravity of the situation and bearing in mind the recommendations of the Education Commission of India (1966), the Government of India issued in 1988 a National

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policy statement on education for the country by giving emphasis on the transformation of the system to relate more closely to the life of the people, a continuous effort to expand educational opportunity and the development of science and technology. The policy also envisaged a uniform educational structure for the country as a whole by adopting 10+2+3 pattern.

The scheme of studies in the first stage consists of an undiversified education for all, to provide enough flexibility to the students to opt for either academic or vocational studies. At the second stage, will provide diversified courses both academic and vocational. A specific provision is being made for “bridge courses” which will enable students to change over from academic to vocational courses and vice-versa. Facilities are also being provided for non-formal education.

Problems in Agricultural Education

From the recommendations of the various previous commissions and committees, it was observed that more stress have been laid on the development of higher education in agriculture than the primary, secondary and non-degree programme of education. To carry out the messages of new agricultural technology to the field of large numbers of technicians and skilled workers are needed at the lower level. This has become all the more necessary as modernisation of agriculture is creating multifarious employment opportunities. This means future farmers must be better educated to understand and practice the new techniques.

All aspects of agricultural development cannot be covered under the formal education system which has certain limitations. Therefore it will have to be supplemented or partly replaced by non-formal education system at various levels to remedy the missing links and to upgrade knowledge and skills of learners.
It is meant for all categories of persons irrespective of age, sex, occupation and school/college going youth; school/college drop outs, persons engaged in various professions and practising farmers for whom literacy is a pre-requisite. It has been repeatedly stressed by various commissions and committees that to accelerate modernization of agriculture the primary producers must be made literate and aware of the tremendous potentialities for increasing agricultural production through the application of science to agriculture.

Need for polytechnic and establishing KVK organisation:

The working group on Agricultural Education/Vocational Agricultural Education of the Planning Commission in its Reports (1967) recommended that Poliit Projects on Vocational Agricultural Education should be started in a phased manner starting from 1968-69. The ultimate aim of the programme was to establish farm boys as successful fulltime self-employed farm operators and as responsible citizens. As the vocational agricultural education envisaged a close relationship between the student, his parents and home farm; it was important to implement the programme as close to the houses of students as would permit their daily attendance. This programme of vocational agricultural education was, however not accepted by the ICAR for reasons given by the Education Commission [1964-66] viz., that those schools could not endow the trainees with the desired level of vocational competence. Instead the idea of the establishment of agricultural polytechnics given by the Education Commission [1964-66] was preferred by I.C.A.R.

Under the chairmanship of Dr. Mohan Singh Mehta, the Government of India appointed a committee to investigate into the problems of skill development in the rural areas and to recommend appropriate short-term and long-term training programmes for farmers, farm youths and farm women. The committee recommended the establishment
of Krishi Vigyan Kendra to function more or less on the 
lines of polytechnics but with access to all those—in the 
rural areas—who would like to improve their skills. The 
committee further recommended that the training at these 
kendras should be linked with the local needs; and to start 
with the main emphasis should be on inservice training and 
on imparting skills to the illiterate rural peasantry.

The Kendras are run on the lines of polytechnics but with 
a difference. For, in these kendras admission is open to all 
those who can read and write. Further, the duration of cours­
es of training is flexible and short—ranging from 2 to 15 days. 
On the other hand, in the case of polytechnics, are organised 
and the minimum entry level qualification is matric/higher 
secondary and the duration of courses is very long and fixed.

Role of polytechnics (agriculture) in Agril. Education:

1. As the first stage up to 10th standard a uniform pattern 
of education further in rural schools, basic agricultural educa­
tion must be made compulsory— as the stream catering to 
the skill requirements through agricultural polytechnics.

2. Agricultural polytechnics should be under the over­
all control of the Agricultural University and the institutions 
of non-farm sector such as ITI, Craft School, Technical 
School etc. should be merged together under a unified system 
of vocational training at "+2" stage.

3. Part time courses should be organised for majority of 
rural work force so as to improve their skill and increase the 
earning capacity through this organisation.

4. Need for expanding training facilities to farmers of 
suitably selected focal points so as to cover a large number 
of farmers.
5. Krishi Vigyan Kendra in each district should serve as the focal point of the training and should concentrate on specific needs of the farmers.

6. Agricultural polytechnic could take up farm-oriented vocational education programme. The non-formal education programmes of adults could generate opportunities for employment in rural areas [Tampi, 1980].

7. Farmers’ functional literacy programme, continuing education of school drop outs and correspondence courses can also be taken up.

8. Non-formal vocational education suitable for tribal areas can be organised.

9. Target oriented educational approach for women, youth, small, big and marginal, crop wise etc. can be concentrated by this organisation.

10. Introduction of agriculture mechanics.

Agricultural machinery and implements are rightly known as “input of inputs” as without this input the benefit from other inputs viz. labour, livestock, seeds, fertilizer, water, energy etc. are not realised to the fullest extent possible. Hence major thrust is being given to the importance of agriculture mechanics as it plays a vital role in each and every aspect of agricultural development.

The instruction in agriculture mechanics is an integral part of the programme in agricultural education. It provides for the development of mechanical abilities essential for success in agricultural occupation and in family living [Phipps, 1980].

A few advantages of the agriculture mechanics instruction may be listed as follows:

a) It provides training in the skills that are necessary to do the needed mechanical jobs in agriculture.
b) It gives students an opportunity to use their hands.
c) It adds variety to a programmes in agriculture.
d) It makes farmers and off-farm agricultural workers realise that the instruction in agriculture is not merely theory but of real practical value when agriculture mechanics is a part of that instructions.
e) It shows immediate results.
f) It affords an opportunity to advertise the work of a department.

An agriculture mechanics programmes include all the mechanical activities that a progressive farmer or off-farm agricultural worker should perform with the kinds of tools and equipment accessible.

The areas of instruction includes:
1. Agricultural shop work
2. Agricultural power and machinery
3. Agricultural buildings and conveniences
4. Soil and water management
5. Rural electrification
6. Processing agricultural products

11. According to Thakur (1974) the multiple cropping involves a high level of energy inputs and a certain amount of mechanisation is involved. The mechanisation here is not suggested as replacement of bullock power but as a supplement to bullock power and/or effort can be made to improve upon the efficiency of the output of the bullock and the human power. In such a situation, it is necessary to train the farmers in the use of the farm machinery particularly pumps, motors and tractors. Despite the unemployment problem, there is a shortage of trained men in the maintenance and repair of farm machinery. It has been noticed that often power sprayers, oil engines etc. go out of order due to inefficient knowledge of their maintenance. It is visualised
that such Agriculture Polytechnic or Farmers' Training Schools will organise training in specialised subjects including maintenance and repair of farm machinery commonly used.

12. Organise an information centre so as to have a direct contact between the farmer and the University through the medium of the Agricultural Polytechnic is likely to prove an extensively beneficial idea in the transfer of technology.

A schematic plan for role of Agricultural Polytechnic in Agricultural Education.
The schematic plan emphasises the Agricultural Education pattern in Agricultural Polytechnics in 3 stages: I Non-formal Education, II General Education and III Professional Education.

Under Non-formal education, all rural population such as illiterate, school drop outs, youths, women and other groups like small, marginal, crop-wise etc. will be covered under one umbrella with various programmes like distance teaching, short training courses, adult education programmes, literacy programmes and so on according to the local needs and the focus of attention on productive aspects like agriculture, animal husbandry, fisheries, rural artisans etc.

In the second level, general education coming under the purview of 10+2 pattern, in which upto 10th standard, basic knowledge in agriculture, animal husbandry, etc. will be imparted orienting their real life situation in rural area [here the agricultural polytechnic will provide technical guidance, agricultural museum, library and training to teachers].

In the second stage, in +2, Agricultural Vocational Education will be imparted covering all fields like agriculture, animal husbandry, fisheries, machinery and rural artisans related to agriculture as carpentry, blacksmithy as diversified courses to suit the needs of the individual taste and interest. In the third stage, professional education comprising two aspects one is at higher level i.e. 4 years degree course leading to B.Sc [Ag.], [Hort.], B.E. [Ag.], B.F.Sc, concerned with Agricultural University, which is not covered in Agricultural Polytechnic.

But the unfortunate youths [after +2 education] not admitted in such higher education may be imparted in 2 to 3 years diploma courses in Agricultural Polytechnics similar to degree programmes, such as agriculture, animal husbandry, horticulture, fisheries, forestry etc. Here emphasis is laid on...
agricultural machinery instruction which is a new innovation to agricultural polytechnic so as to suit the growing needs of agricultural development.

Conclusion

With the increasing and growing demands for professional education, Government cannot accommodate all educated youths in a limited institutions like University. This group becomes unfortunate and mis-educated in future, is on one side and on the other side, people concentrated from school drop outs due to economic background, unequal intelligence and other reasons will be waste of human resource in the country.

All these resources can be properly processed, designed and made productive for real life situations through agricultural polytechnics by establishing in focal points of each district so as to cover each and every individual without missing any of the aforesaid category under one umbrella.

By this venture, we can develop all individuals for self-employment and for their self-sufficiency.

References


With the abundant human resources and 'trial and error' method of policy formulations, India has been attempting to make optimum use of its natural wealth through a variety of technological options. In spite of all educational efforts and the dramatic transformation of agriculture in certain areas, a sort of 'endogenous depression' exists among the good majority of potential beneficiaries, particularly among weaker sections including small and marginal farmers. We have been making effort to refine the development programmes so as to keep them tailor-made to improve the managerial efficiency of the farming community. Our experiences indicated that our efforts may often could not satisfy the demands of technical skill development among farmers, which is a major component of their managerial efficiency, though we could satisfy the hunger for new knowledge to some extent. This fact has been rightly pointed out by the Education Commission, which suggested the formation of training institutions to meet the emerging needs of skill development among farmers and a cadre of middle level technicians to assist the development.

While thinking about an institution to accomplish all training needs at the lower level, it should necessarily contain different spheres of rural life, along with strengthening of supports and services needed by them. Such an institution,

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Agricultural Polytechnic, should form a centralised model institution with adequate facilities of farm, laboratories, personnel etc, to impart meaningful training programmes of different styles and duration can be framed for youth, women and adults to generate skilled workers and middle level technicians in agriculture for the supporting services needed by the farmers, for assisting in extension, for many trades and industries based on agricultural products and services. Creation of agricultural polytechnic, one each in every district as suggested by G.V.K. Rao Committee, should precede an integration of different existing training institutions such as Rural Development Training Centres, Farmers Training Centres, Agricultural Schools and the like so that the present resources can be best utilised, avoiding a duplication of efforts.

The Agricultural Polytechnic should be essentially a multi-purpose institution providing a wide range of training in specialised courses related to internationalisation of skills needed in agriculture, animal husbandry, horticulture, forestry, fisheries, sericulture, mechanisation, processing industry, etc. The courses are to be mostly non-formal in nature generating farm managers, farm mechanics, craftsmen and technicians in agriculture and allied fields, and assistants for extension and support activities. The duration, syllabus and intake of each course may be decided upon in relation to the needs and demands of the location where the polytechnic exists. The courses should be terminal in character leading to specific vocations and to maintain the technical competence. These polytechnics can be attached to the Agricultural Universities. A team of qualified teachers, well equipped laboratories, small processing plants and workshops and necessary opportunities for practical exposure and experience are also essential to make the polytechnic meaningful.

The Agricultural Polytechnics can handle a variety of training courses to different categories of beneficiaries. It
should be able to offer long term courses such as a Diploma in Agricultural Sciences of three years as well as short term courses for specific skill development extending to a duration to five days. The diploma or certificate courses can cater to the lower level manpower needs of various development organisations whereas other courses would be for either refresher training or self employment oriented training. The polytechnics can also provide on-farm training to improve skills and knowledge of practicing farmers, as well as management training to women and youth for better styles of living. Generation of a team of local technicians among youth for their gainful employment on topics such as repair of pumpset and other farm machinery, construction of low cost water storage and conveyance, plant protection operations, primary processing of agricultural produce, etc. can be taken care of by such local based training institutions.

Such an institutional structure at the local level can help to meet several existing issues of development by improving the 'Social Synergy' conceptualised by the famous anthropologist Ruth Benedict. He suggested that human societies could be made non-aggressive by reducing energing frustrations, mainly through social arrangements ensuring mutual advantage from the undertakings of individuals and providing chances of mutual reinforcements. And from experience, we have already realised that such a social arrangement is imperative in our villages.
NEED FOR AGRICULTURAL POLYTECHNICS FOR RURAL DEVELOPMENT

L. N. KAR*

1. Since independence a number of attempts have been made to raise the standard of living of our rural people. At the same time, emphasis has been centered around to expand industries with a view to produce various types of goods and divert some population depending on primary occupation to a secondary one. In spite of all these efforts, 66.7 per cent of our population are still engaged in the primary occupation whereas only 33.3 per cent depend on secondary and tertiary occupations. Since 1901, the shift from primary occupation (71.8 per cent) to secondary or tertiary ones has not achieved any significant change. The situation does not seem to change much on near future.

2. Again, 40 to 50 per cent of the population who are considered below poverty line are either engaged in agriculture or working as wage earners. Further, the problem of unemployment is also aggravating the situation. Every year, thousands of rural youths who are either school drop outs or educated up to matriculation and graduate level are migrating to urban areas in search of employment. According to a report, the number of unemployed youths now exceeds 220 millions and by the end of the century the figure may go up to 250 millions. It is certain that no government can ever provide employment to all these unemployed people whose number is increasing very fast.

3. Under such a critical situation, some thing must be done to provide employment and help these people to earn

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living. Of course, Government of India has launched certain programmes including "TRYSEM" to provide training to rural youth for self employment. But this programme has not been very effective to solve the problems due to some reasons or other.

4. Under Integrated Rural Development Programme (IRDP), people of the weaker sections are provided loan to take up enterprises of animal husbandry, poultry farming, fish farming, goatery etc. Common observations reveal that most of the beneficiaries are either selling away their animals or sustaining loss in the enterprise. There might be many reasons responsible for this deplorable condition but the most important one is the lack of technical skill to manage such vocations as remunerative ones.

5. Majority of our rural people are engaged in agriculture but the per acre yield of most of the crops in our country is lower than many of the advanced countries. For example, rice is grown as a major crop in India but the per hectare yield is only 1500 kg while it is 5761 kg in Japan, 6295 kg in Australia and 6341 kg in Korea. There might be many valid reasons for this low level of production, but the knowledge gap about modern farming among cultivators probably is the most important one. For a study conducted in coastal districts of Orissa, it is observed that the knowledge level of the contact farmers under T & V system was found to be only 50 per cent. When the farmers do not know how to grow a crop as per the recommendations it is not surprising to observe low yield level with them.

6. Considering all these points, time has come now to think seriously of some type of institutions which could provide help and guidance to the rural people in order to overcome these difficulties. We have now 26 Agricultural Universities and a number of agricultural colleges in our country but the products from these colleges and universities are mostly job seekers and hardly any of them go for
private enterprise. The knowledge and skill which they acquire are rarely used by them to increase production. In order to save such a situation we should think of agricultural polytechnics where rural youths could be trained on agriculture and allied enterprises, so that they will be technically competent to take up any of such vocations thereby without running after jobs.

7. In each district, there should be at least one Agricultural Polytechnic, to be located in a suitable rural background. The School should have facility to impart training on various aspects of agriculture such as general agriculture, fruit preservation, plant propagation technique, maintenance and operation of improved agricultural implements. Similarly, there should be also courses on animal husbandry and dairying, artificial insemination, production and preservation technique on various milk products, poultry farming, feed processing, piggery, goat and sheep rearing, fish farming, spun production, bee keeping, sericulture etc. In addition to these, there should be also training facility on different crafts or agro based small scale industries.

8. In this polytechnic, emphasis should be given for practical training which should be made work-oriented. In this context, it may not be out of place to mention that in our Agricultural Universities and Colleges, less attention is given to practicals and students in general are now reluctant to soil their hands. Practicalis should be done through work-experiences in order to provide better skill and confidence.

9. To facilitate practical training, each polytechnic should maintain model farm, orchard, dairy, poultry units, piggery, fish farm, well equipped workshop and other facilities. The students, trained in these polytechnics may not be given a diploma or certificate otherwise they will demand for jobs like present day agricultural graduates. Persons interested in self-employment should be given admission so that after training they will go back to their villages and try to
practice any of the vocations according to their interest and capacity.

10. These polytechnics should be managed by the Agricultural Universities so that technical expertise to run such institutions will be readily available. At present, we have Krishi Vigyan Kendras in some districts financed by the ICAR and managed by the Agricultural Universities. To start with, these KVKs should be converted into polytechnics with the financial assistance from the I.C.A.R. After observing the performance of these polytechnics, steps should be taken to extend to other districts in a phased manner. State Governments should also be requested to provide funds to these polytechnics, as products from these institutions will be able to play very important role in improving the economic condition of the State.

11. Admission to these polytechnics should be opened to the sons and daughters of the soil. The DRDA, Community Development Department and Tribal Development Agency etc. may sponsor some candidates for this type of training. But in general it should be opened to those who are really interested in self-employment. The trainees may be given some stipend towards boarding expenses.

12. Government should consider giving loan on priority basis to these people, trained from the polytechnics, so that they can run their professions in a better way. This will also help reduce number of job seekers and encourage people for self-employment.

13. If every year about 500 young men and women will be trained in different aspects of agriculture and allied vocations in these polytechnics and will be assisted in taking up these vocation, then within a period of five years, about 2500 well trained people will be in position to take up self employment in each district. This will ultimately contribute towards development of the area.
14. Similarly, if 10 to 20 people from each Block, after receiving training in the polytechnics will start their farm and run them efficiently, then it will have tremendous impact on the rural society. These farms will act as 'models' for other people and help in disseminating latest technology among rural people. Trained people will definitely do their jobs better than untrained people.

15. Our political leaders, administrators, scientists may now think of this idea of setting up of Agricultural polytechnics and take prompt decision to execute the same without further delay. The sooner it is done, better it will be for our people and for our country.

Polytechnics, if established with sound objectives as stated above will definitely help in:

1. Improving technical skill of the rural people on agriculture and allied subjects.

2. Create opportunities for self-employment thus reducing pressure on jobs.

3. Help in increasing production by application of latest technology by a group of well trained people.
ROLE OF AGRICULTURAL POLYTECHNICS IN AGRICULTURAL DEVELOPMENT WITH SPECIAL REFERENCE TO LIVESTOCK PRODUCTION

H. S. RAMAMURTHY and M. N. SINHA*

Agricultural education has passed through several stages where agricultural polytechnics were the first to appear. Establishment of agricultural schools and colleges (1907) and starting of Indian Dairy Diploma (1924) were milestones in the history of agricultural education. These were converted into colleges awarding basic degrees and postgraduate degrees. Many pioneers in agriculture and dairying were trained by these schools and centre. They thinking that polytechnics are unnecessary when degree courses are offered has closed down several centres training middle level technicians to serve research, education, extension, development including agroindustries and marketing. The gap created by specialised degree programmes and “10 + 2” system of education has now becoming clear to educational policy makers and advent of specialised courses was inevitable at Pre-University course.

Why Agricultural Polytechnics?

1. They only can provide specialised knowledge and skills required by middle level technicians who are in demand both in agriculture and agro-industries. Graduates and postgraduates may have superiority complex for doing such jobs thinking that it may ruin their future may not fully dedicate to such jobs. The P.U.C. trained personnel may not afford such specialised training and confidence with which technically trained personnel can work.

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2. The agricultural polytechnics can offer need based, advanced training when attached to Agricultural Universities/ Research Stations which may not be forthcoming in cases of P.U.C. Course.

3. The facilities available in Agricultural Universities/ Research Institutes will suffice the requirement of training middle level technicians.

4. Training of middle level technicians in agricultural polytechnics saves time and energy of the employer which is otherwise wasted in training general graduate/P.U.C./Metric personnel.

5. Agricultural polytechnics can assess the needs of the agriculture and industry, and accordingly modify the curriculum to suit the needs.

The target groups of Agricultural Polytechnics


B. In Research and Educational Institutions: Lab Assistants, Field Assistants, Technical Assistants, Analysts and investigators.

C. In Farms: Field Assistants, Farm Supervisors.

D. In Plants: Dairy Supervisors, Field Procurement and Marketing Officers.

E. Others: Field Level Officials in Co-operative Marketing Boards etc.

Status of Agricultural Polytechnics in Livestock Production

There is no organised effort for establishment of polytechnics in livestock production. 14 colleges/universities
and other institutes are offering diploma/certificate courses ranging from 6 months to 2 years. Subjects also varied from dairy, husbandry, dairy technology, livestock production, dairy engineering, fodder production and utilization, A.I. and first aid, to composite farming. Even the eligibility differed from metric/P.U.C. to diploma in engineering. Some of them were restricted to inservice candidates.

**Needs of Dairy Industry**

Indian Dairy Diploma was started in 1924. A study conducted by Sinha (1979) and others revealed that over 50 percent of the dairy personnel employed in 105 dairy concerns were IDDs. Most of IDDs (85.54%) were utilized for plant operations in supervisory and managerial cadres in field operations associated with dairy plants they were functioning mostly as Milk Marketing Officers, Dairy Extension Officers and Milk Procurement Officers. IDDs Dairy technology was preferred for plant work and IDD (Dairy Husbandry) for field work. Common reasons for employing IDDs were practical training, capability for managerial and supervisory work and proficiency to operate the dairy plant machinery. Over 75 per cent of the plants wished the IDD to continue.

**Guidelines for developing a model polytechnic in livestock production**

1. Polytechnics in Livestock Production may be established in every district especially where livestock production is of importance.

2. Each Polytechnic may recruit metric completed students for diploma course in livestock production for three years.

3. Specialization may be offered in the final year in the following areas:
   1. Dairy Husbandry
   2. Dairy Technology
   3. Poultry Farming
4. Sheep Farming and Wool Technology
5. Animal Health
6. Goat Husbandry and Meat Production
7. Fodder Production and Utilization
8. Other livestock of regional/minor importance: Camel, Mithun, Ducks, Piggery etc.

4. Veterinary/Dairy Science/Animal Husbandry Colleges may start offering diploma immediately. After due course the polytechnics may be separated.

5. Postgraduate diploma may be offered in different specialised subjects for lecturers of agricultural polytechnics at Agricultural Universities and ICAR institutes, NDRI and IVRI are already offering some such courses. e.g. Dairy Management, Quality Control, Animal Reproduction, Preventive Veterinary Medicine and Surgery.

Future strategies

1. Agricultural Polytechnics may be opened in all faculties of Agriculture; Crop production, Horticulture, Agricultural Engineering, Dairy, Veterinary, Fisheries, Sericulture, Food Technology, Forestry and Rural Development including Marketing Cooperation, Extension and Communication.

2. Specialised polytechnics may be established in specific areas where it is called for e.g., Marine Fisheries in coastal areas, Forestry in districts having more forest potential.

3. A separate Board for Technical Education for Agriculture may be set up till then agricultural universities may take charge of such polytechnics.

4. In colleges where already agricultural degree programmes exist, diploma may be restarted immediately and gradually polytechnic can be separated.
5. Colleges and Junior Colleges which are near to Agricultural Research Stations and Colleges may be adopted for 5 years for development as independent polytechnics.

6. Each strong Regional Agricultural Station may start agricultural polytechnics making available their facilities. Additional staff and facilities to be provided.

7. Voluntary agencies, educational trusts and milk federations may be encouraged to set up agricultural polytechnics.

8. Agricultural Universities/ICAR Institutes may start postgraduate diploma courses to train the lecturers of the polytechnics.

9. Each Agricultural University/ICAR Institute may assess the needs of middle level technicians in their jurisdiction (State/faculty) and suggest for establishment of required number of polytechnics.

10. Wide publicity to be given as to the availability of trained technicians to the departments, farms, industries, voluntary organisations. Suitable posts may be reserved for these trained technicians.

11. Personnel holding diploma may be preferred for undergoing degree programme in the concerned subject.

12. Many Krishi Vigyana Kendras/Farmers Training Centres may be gradually upgraded into agricultural polytechnics.

Role of Agricultural Polytechnics in Regional Development

The training of middle level technicians is not the only aim of the agricultural polytechnics. In fact, it is only the middle range objective. National Commission on Agriculture (1976) commented on this aspect.

The existing institutions are equipped to train students for rural profession in government or semi government
jobs, but hardly suitable for self employment and various occupation roles they are expected to play in rural community.

The following are the ways for regional development.

1. Agricultural polytechnics shall serve as information centres for farmers and field extension workers.

2. They can be advanced training ground for field functionaries and farmers.

3. Agricultural polytechnics may have contact with their alumni and get feed back from them regarding usefulness of curriculum in development and modify to suit the development.

4. Agricultural polytechnic shall raise the image of scientific agriculture through its students and alumni among farmers of the region.

5. Agricultural polytechnics all plan for overall agricultural development and coordinate with the agencies in rural development for betterment of the region.

6. Agricultural polytechnic shall inculcate among its students the dignity of labour attached to farming and encourage them to take up self employment. In a nutshell agricultural polytechnic can be a promoter of scientific agriculture and rural development of the region.
TECHNOLOGICAL TRAINING FOR PROMOTING SELF-EMPLOYMENT

N. NARASIMHA and M. K. SETHU RAO

India is a country endowed with unutilised and under-utilised human capital which is a potential source of economic growth. This can be brought about through impetus of rigorous training and exposure to the contemporary developments in the sphere of economic growth. In this note we propose to explore the avenues for training to promote human resource development through self-employment in the field of agriculture.

Need for orientation on self-employment

It is disheartening to note that the farm university graduates who get educated in the urban centres develop aversion to move into rural areas after graduation. Most often they are risk averse and hence prefer the "White collar" occupations. This is an addition to the usual migration of rural people to urban areas in search of employment opportunities. As our economy is not buoyant in absorbing the increasing demographic pressures due to migration. Hence it is desirable to develop alternative avenues of self-employment opportunities to provide gainful employment.

Vocational training

The importance of vocational training in our educational system needs no special introduction. Such a scheme is successfully operating in countries like U.S. and Japan. This vocational training should preferably be in sectors with higher practical utility, so that sufficient employment sets generated.

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In the field of agriculture vocational training should be in agriculture and agrobased industries. These fields are discussed below.

1. **Supply of seed material**: There is wide demand for quality seed material for raising horticultural and agricultural crops. The production and marketing of seed materials needs skill and business ecumen. This could be initiated in the educational training programme. The propagation of nursery materials, growing of flower and aesthetic plants in pots for commercial purposes, aromatic plants cultivation, cut flower exports, supply and service of potted plants to business centres and industries around urban centres, are a few of the programmes.

2. **Agricultural implements**: In recent times, farmers are facing the problem of quality implements and equipments, the use of which is sineital-quo-non in adoption of new technology. Further servicing and hiring of these equipments are also not fully developed. Hence training on preparation of agricultural implements and servicing and repairs of equipments and developing expertise on post harvest technology, useful in cold storage, warehouses would go a long way in providing potential employment opportunities.

3. **Oil extraction**: The medicinal and aromatic plants have essential oils which are useful in Agarbathi cosmetics, and medicine preparations. The cultivation of these plants is getting largely limited due to inadequate number of oil extraction units. Training in this field would encourage cultivation of Citronella grass, Tuberose, Clove, Jasmin, Champke, Rose, Cinnamon, Eucalyptus, Dhavana and *Vinka roseas*. This would also break the existing monopoly in oil extraction which is at the hands of few individuals.

4. **Consultancy on use of PERT and CPM**: The PERT and CPM techniques are extensively used in project planning, implementation and reporting. In addition, preparation of projects for plantations, poultry, dairy, piggery, fish culture,
and irrigation would also be another set of employment orientation programmes. Training in these fields would thus help improve the human capital of agriculture graduates.

5. Manufacture of livestock feeds and health care of animals: Training could also concentrate on preparation and mixing of poultry and dairy feeds, First aid training on animal health care, preparation, production and marketing of silage in the post glut season, would create an enormous self-employment opportunities for graduates of agriculture.

6. Farm clinic: A Bureau of Agriculture working to provide latest information on different programmes offered by voluntary organisations and the government would help farmer's to realise the benefits. In fact many a time due to lack of information, the potential beneficiaries do not avail of the facilities. Hence, farm clinic covering the above aspects could be started. Such clinics should primarily provide services of controlling pests and diseases, and should also involve in other useful activities, mentioned above. This also includes, expertise on soil and water conservation techniques, soil reclamation, which will be in great demand under rainfed and irrigated conditions respectively.

7. Agro-industrial development: In the primary production areas of coconut and jute, there are avenues in the fibre extraction sector, which has a potential market. Proper training in this regard can make the graduate to be self-sustaining as the demand for such products is universal.

Similarly keeping Beehives on the farm and around house and house tops and extraction of honey and wax is a developing proposition in apiculture.

8. Dealership in non-farm inputs: Dealership in fertilizer, pesticides, insecticides, seasonal supply and service of inputs, provision of transport facilities from village points to urban centres, to avoid wastage of time and perishability of goods from the hands of middleman, and supply of agricultural raw
products like sugarcane, tender coconut, vegetables, fruits, flowers and so on by graduates from farm to cities, performing the duties of middle man are other avenues of self-employment.

9. *Mass media participation:* The rapid extension of agricultural technology has also emphasised the needs for innovation in the mass media in order to make an effective impact on adoption of new technology. In this regard training has to be extended to cover agricultural journalism, advertising techniques, preparing documentaries (visual and audio-visual), radio talks, TV programmes, and making folders intensively. There are also the new avenues for employment especially for those who have the flair for scientific extension education.

10. *Export trade management:* The field of export is considered as a risky venture and it requires substantial capacity to absorb the shocks due to the price fluctuation in the international markets. However, as a measure of support to small exporters the Government of India has developed several programmes which can be capitalised by agricultural graduates. This would help in increasing the degree of competitiveness in the export trade, and thereby result in price advantage. Such potential is available in the field of exporting spices, crops like cardamom, pepper, cinnamon, clove and costly items like saffron and basumathi rice. This measure would also help in improving the quality and reducing pilferage of the products for export as the graduates are well trained in quarantine aspects.

**Conclusive remarks**

Due to the increasing pressure on land, the opportunities for profitable endeavours are getting limited, in the field of primary production. This has necessitated the rapid expansion in the secondary and tertiary sectors of agriculture, like the development of agro based industries, cold storages, transportation companies and the consultancy services. Further
the opportunities for agriculture graduates in the formal (Govt. and Semi Govt.) sectors is also becoming limited due to saturation. Hence, there is dire need for the graduates to look for self-employment vocations.

In our note, we have made a coverage of self-employment potential. Baring a few activities like export trade, mass media participation and farm clinics, a majority of other activities listed could be the subject matters for training even matriculates, through the agriculture polytechnic. It is desirable for the universities to decide on diversification of their teaching and extension activities to cover the above class of the population, in order to achieve human resource development.
RURALIZATION OF HIGHER EDUCATION IN AGRICULTURE

J. V. GOUD*

Agriculture is the backbone of Indian economy providing income to more than 65 per cent of the total population. It contributes nearly one-half of the national income and earns foreign exchange through exports. Nearly 80 per cent of the population in India and 83 per cent of work force live in rural areas. The occupational structure of rural working people also reveal that 85 per cent are dependent on agriculture and allied activities. Of the total work force engaged in agriculture in rural areas, nearly 42 per cent is comprised of cultivators. If one considers the productivity of an Indian farmer, it is no where comparable to any of the developed countries in the world. The basic problem is not a poverty of natural resources but under development of human resources. The primary task, therefore, is to build human capital in terms of improving education, skills and aspirations of men, women and children. Agricultural education of right kind is indispensable for economic progress. Thus agricultural education can be viewed as a means of achieving the goal of agricultural development.

Development of higher education in India

Although organised higher education in agriculture through establishment of agricultural colleges was introduced as early as in 1907, the pace of development was rather very slow, considering the needs of the country. When India attained independence in 1947, there were 17 institutions of higher education offering degree courses in agriculture and these were affiliated to traditional universities. Looking to

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the weakness of traditional system and to link programmes of agricultural education to that of production programmes, Education Commission in 1949 suggested for establishment of “Rural Universities” and this later lead to the establishment of first Agricultural University in 1960 at Pantnagar on the model of the Land Grant College system in USA, where teaching, research, extension education and home science are integrated into constituent colleges under one administration. Consequently, establishment of agricultural university at least one for each State became a reality and at present there are 26 agricultural universities with more than 188 colleges for higher education in agriculture and allied subjects.

Present status of higher education in Agriculture

At present, with limited agricultural colleges, agricultural graduates produced from these institutions have been able to meet the lucrative job opportunities in teaching, research and extension departments, commercial banks and private organizations like seed, fertilizer, pesticide industries, and only a negligible number are engaged in self-employment. Besides, only a limited number of students entering Agricultural Universities have the requisite rural background. Further, students with little interest and aptitude for agriculture join the programme as a last choice. Under these circumstances, there are two aspects before the education policy makers in agriculture. First, imparting higher education in agriculture to meet the demand of various diversified service sectors and second, to meet the emerging situation of modernisation of agriculture and give it a rural base to form a firm foundation for rapid rural development through agriculture and self-employment. So far, the institutions of higher education in agriculture have taken care of only the first aspect. However, with increased rural population, mass illiteracy and induction of modernised and commercial outlook into agriculture, ruralization of higher agricultural education has become a necessity now more than before.
Concept of Land Grant Institution, its myth and reality in under-developed countries

Establishment of Agricultural Universities in each State based on American Land Grant Institutions with diversity in disciplines, graduate programmes, research and all its services blown up would not serve as effective means of infiltrating higher education to rural mass. This is one of the reasons why emulating American Land Grant Institution as a model would be a mistake in under-developed countries like India. J. Gordner Gibson, Campus Coordinator at California State Polytechnic College, states that our land-grant institutions are today primarily involved in high level professional occupations and research. Dr. Jack Peltason, former Dean of College of Arts and Science at University of Illinois expressed that a College of Agriculture on the other hand is like any other professional colleges like law, medicine and engineering calling upon all areas of learning to train men for particular profession. What is needed in under-developed countries is institutions that have the land-grant approach since these are primarily agricultural nations, training for agricultural profession would be their predominant responsibility. Added to these, recent studies made by Haque (1985) in India on regional trend and diversification reveal that despite some occupational shifts in rural sector from crop production to animal husbandry, poultry, fishing and forestry in recent years, the country's economy remains largely crop based. Therefore, the policy makers should draw their attention to these facts, while considering ruralization of higher education in agriculture.

Scope for ruralization of higher education in agriculture

Today, agriculture in India is in a state of transformation from subsistence to or semi-sub-sistence a commercialized agriculture. Survey of agricultural education in Asia by UNESCO have shown the tendency to do away with primary instruction in agriculture and raise sub-professional
categories to a degree course because the primary level students are too immature physically and psychologically to appreciate the science of farming and the value of manual labour. When experience become meaningless and a drudgery to young minds, it may instil a distaste for agriculture instead of developing a favourable attitude. Assuming that most school-leavers at this stage take to farming they are unlikely to engage in manual operation in agriculture because of immaturity and lack of appreciation of dignity of labour.

National Commission on Agriculture (1976) reported that for the next few years the principal task of Agricultural Universities would be to provide high level under graduate education. The report further stated that the emphasis in under graduate programmes should be primarily on production or husbandry oriented or management, extension, supply and services. Besides, with emerging situations of modernised agriculture, there is an increased demand for scientific manpower for agricultural development and provision should be made for the flow of required competent agricultural graduates (not elite graduates) who have a broad training in Agriculture with appreciation of practical problems of farmers and an ability to demonstrate and distil the principles and practices of good husbandry. In order to fulfil these, the under graduate programme in agriculture must be conceived as terminal professional degree with emphasis on production oriented practical training based on scientific principles coupled with experience of farming conditions in the villages. To ensure this, students in addition to the practicals in different subjects should have training in skills in farm production. To impart strong base of practical training and to understand constraints and difficulties in implementing modern technology in agriculture, students must be made to gain experience in the villages with selected progressive farmers or in well established farms of the Agricultural University. This type of practical training and work experience on farms in villages
conditions has to become a part of the structure of undergraduate curriculum in agriculture.

Reorientation and ruralization of higher education in agriculture

In the present set up of Agricultural Universities, higher education in agriculture is mostly concentrated at main campuses. Very recently, a beginning has been made in decentralization and Karnataka State at present has three colleges. A major limitation in rapid expansion and regionalization of higher education in agriculture is the high cost of establishment when compared to the traditional colleges. Therefore establishment of agricultural colleges at different locations may not be a practical proposition with all the limited resources of State Government. At best in the first place as a compromise to encompass diversified disciplines in Agriculture, establishment of agriculture college (or can be called as Teaching Centre or Regional College or Agricultural Institute or any other suitable nomenclature) one each for district can be thought of. These colleges should in first place impart strong base in Agriculture [2 years] and have terminal diversification [last 2 or 3 years] in Forestry, Horticulture, Sericulture, Veterinary, Dairy Science, Fisheries, Home Science and Agricultural Engineering. Such graduates can fit in well in any field of Agriculture and also broaden their base for professional outlook for self-employment. To suit this concept, whole undergraduate curriculum needs to be modified. Besides, these colleges must be need based and should be started through the participation of the farming community. Thus these colleges should become “peoples’ colleges” rather than University colleges. Peoples college in the sense, people deriving benefit from these colleges should involve and organise themselves to provide sufficient land, basic infrastructure so that established colleges will become self-sufficient in its financial requirement and for further development. Finances could also be made to flow for these colleges from agro-based industries [sugar factory etc.]. Agriculture Produce
Market Committees, Cooperative Banks etc., from where farmers derive benefit from these organizations.

Alternatively, UAS can think of upgrading and strengthening of existing Regional Agricultural Research Stations to form Regional Agricultural Colleges to perform the integrated functions of teaching, research and extension to augment the process of regionalization of higher education in Agriculture.
REGIONAL APPROACH NECESSARY FOR RURALISATION OF AGRICULTURAL RESEARCH AND DEVELOPMENT BY AGRICULTURAL UNIVERSITIES IN INDIA

K. A. JALIHAL*

The Agricultural Universities in India which are supposed to have been modelled both on the rural university concept of the Radhakrishnan Education Commission and the U.S. modelled Land Grant Colleges, have yet to play a major role in carrying out the three functions of agricultural teaching, research and extension through regional centres.

The present practice adopted by most of the agricultural Universities in India has been to concentrate on research activities alone in the regional areas and localising agricultural education and extension in selected campuses of the States. The regional approach in the research has been further strengthened by launching of the National Agricultural Research Project funded by the World Bank in recent times. However, this regional approach in agricultural research alone will not be sufficient to transfer agricultural technology in rural areas without simultaneous development of regional approach in the fields of agricultural education and extension by agricultural universities Mr. C. Subramaniam, Ex-Union Minister for Agriculture in his recent theme paper presented in a seminar on Indian Agriculture held at Coimbatore in 1982 has strongly pleaded for such a regional approach.

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Japan, although a small country, is already in the forefront in implementing this kind of regional approach in agricultural research teaching and development. The Regional Agricultural Experiment Stations in Japan have been transformed into Regional Agricultural Institutes which carry out all the three functions of agricultural research, education and extension, although agricultural universities have not been set up in that country. In these Regional Agricultural Institutes of Japan, only about 50 per cent of the budget is spent for research, while the remaining portion is used for student teaching and for providing services to farmers.

It is, therefore, time, that we in India, now take a serious look at the function of the agricultural research stations in different regions and develop a plan to transform these into regional agricultural institutes for carrying out all the three functions of agricultural research, education and extension. This is a necessary step for ruralisation of agricultural research and development.

In developing these regional agricultural institutes, some of the important recommendations of the Radhakrishnan Education Commission on rural universities should also be kept in mind.

Important Recommendations of the Radhakrishnan Education Commission on Ruralisation of Education

College locations: "The crowding together of thousands of undergraduates, as in the case of some existing universities, is highly undesirable. A way should be found to combine the advantages of small resident, undergraduate colleges where there are close relations between teachers and students, with advantages of fully developed universities which offer a wide range of specialised and advanced educational opportunities to
advanced students, or to other students, with specialised interests."

"As a general type of arrangement, it is suggested that a rural university should include a ring of small, resident, undergraduate colleges, with specialised and university facilities in the centre."

New kind of education: "Rural education, like all education, should not limit itself to the process of school room, but at every stage from primary school to university, should insist that pupils and students shall learn also from the great traditions of common life."

"These great traditions are among the most priceless treasures of mankind, of more value than our material possessions. One of the chief criticisms of the present system of education is its tendency to rely on verbal description rather than on actual participation, and thereby partly to lose and essence of the great art of living."

Rural education and research: "Development of the spirit of free inquiry should be a chief aim of basic education, and of the secondary and higher education which grows out of it. More important than the teaching of any particular subject, encouragement of the spirit of free inquiry in every field".

Rural education and development: "Similarly, the rural university could be the regional centre for all such rural service agencies. Rural workers and directors would profit by rural university associations. Faculty members of the University would profit by constant contact with those directing the field work, and university students in their part time work could assist rural workers and could be in training for similar services."
It would be a great loss to India for the varied rural services to develop without such coordination with rural education.

It may not be necessary that all the regional agricultural centres can immediately take up agricultural education work at the college level. Where adequate infrastructural facilities are presently available, this could be done. In other regional institutes having less infrastructural facilities, short diploma courses in agricultural sciences of one year duration or even 3-6 months duration can be started and gradually degree programmes could be started. Education function of the regional centres should also include training of farmers in different enterprises suited to the region.

The regional centres should also participate in the apprenticeship training programme to be started for agricultural students which is an immediate need for imparting practical training to the agricultural students before they graduate.

It is important that all these regional institutes should immediately take up extension work in whatever limited way it may be possible, keeping in mind the fact that large scale extension work is the responsibility of the concerned State Government Departments. The extension functions of the regional centres should include limited extension work to be done by the staff of the centres, at least in the villages around the centres in order to make their expertise available to rural people and also to participate in trial and early demonstration programme in order to get the required feed-back from the field. The extension programmes should also include setting up of a consultancy service for the benefit of farmers of the region.
Major issues involved in ruralisation of agricultural education, research and development

1. Creating viable regional agricultural institutes utilising the existing infrastructure facilities: It is possible to create viable Regional Agricultural institutes by utilising the existing infrastructure facilities in many cases. Instances are not uncommon where, number of agricultural centres are presently functioning under different agencies like State Departments of Agriculture, Horticulture and Agricultural Universities in the same locations or nearby locations in a particular region. It should not be difficult to integrate these centres into one viable Regional Agricultural Institute.

2. Building additional infrastructural facilities for selected Regional Agricultural Institutes: Apart from the general consumer, farmers and agro-based agricultural marketing institutions, and other corporations and industries are direct beneficiaries of agricultural education, research and extension. It is reasonable to present a view point that these direct beneficiaries shall come forward to provide financial support to strengthen some selected regional agricultural institutes. The recent decision of the Karnataka Government, to allow the Regulated Market Committees to finance agricultural universities for agricultural research and development is a welcome move in this direction.

3. Provision for 'earning while learning' in selected regional agricultural institutes: Agricultural education is expensive particularly for the sons of small farmers. As a result, generally it is beyond the capacity of ordinary people in the rural areas particularly small farmers to send their children to colleges of education. In at least some of the regional agricultural institutes
which are having extensive farms running into more than one or two hundreds of hectares, it should be possible to provide for rural students earning while learning opportunities by entrusting the management of 5-10 hectares of land to each student. It should also be a long range policy to provide extensive farms to all Regional Agricultural Institutes to help in this direction in the years to come.
SOME PERSPECTIVES IN RECONSTRUCTION OF 
EDUCATION IN INDIA

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R. RAMANNA *

The National debate on how to reconstruct and reorient
the educational system of the country to make it more
relevant to the developmental needs has been initiated.
It is expected that the resolution of this debate at different
levels would provide the kind of concrete consensus
required for the formulation of the new Education Policy.
The document, "Challenge of Education: A policy perspec­tive", brought out by the Ministry of Education, Govern­ment of India in August, 1985 has focussed on reduction
of inequality of educational opportunities, relevance of
education to the country's development needs and expec­tations, utilization of the existing educational infrastru­cture and improvement of the quality of education,
modernisation and strengthening of the content of science
and technology in education, and the creation of a national
system of education. Further, the Indian National Forum
has also prepared a Draft of the Education Policy of
India, focussing on facets such as physical and spiritual
aspects of man, social and natural environment, producti­vity of education, technical and scientific education,
parental (community) involvement in educative process,
and decentralisation of administrative and management
network. The main challenges for us is to operationalise
these facets with concrete proposals and programmes.
This paper is an attempt to provide some perspectives
on the reconstruction and reorientation of education, with
an emphasis on agricultural education.

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Agricultural Education

*Land Grant College Model: A Good Experiment*

Establishment of Agricultural Universities in India in the 1960's, patterned after Land Grant College Model of the U.S.A., has been acclaimed as an innovation in institutional development for transforming Indian agriculture. These agricultural universities are expected to direct and sustain their major efforts towards bringing the full force of science and technology to bear on the problems of rural areas. The programme of education for agriculture is based on three main elements—development of the appropriate technology to practicing farmers, extension, and training of the needed personnel through teaching. Philosophy of service and dedication to the rural folk is the guiding principle of this Model. It is declared that practical utility, not snobbish academic responsibility nor any notion of intellectual aristocracy, must be the signpost to direct the activities of these Universities. These Universities are supposed to have concerns for:

- all aspects of increasing, disseminating and applying knowledge related to agriculture
- teaching and research directly and immediately related to the solution of the social and economic problems of the rural areas
- readiness to develop and teach the wide range of applied sciences and technologies needed to build up the economy
- readiness to teach not only regularly enrolled students, but also to give specialised technical training to young people who are not candidates for degrees.

No attempt is made in this paper to infer anything substantial to suggest how far the Agriculture Universities in India have met the criterion of compatibility...
between role expectations and role performance, and what are the possible casual factors for the gap between role expectation and role performance. However, evidences are there to indicate that Agricultural Universities have been the major partners in the development and spread of new technologies in promoting the science-based agriculture among farmers and in reducing our dependence on foreign food imports.

Ruralisation of Agricultural Education

With all these, there are some compelling reasons for which reconstruction and reorientation of agricultural education in India is imperative. Let us indulge in introspection on how have we steered the path of agricultural education to cause a drift from the major goals. While promoting the idea of establishing “Rural Universities”, the Educational Commission (1949) headed by Dr. S. Radhakrishnan has recommended that education should be given in rural setting by establishing Rural Universities. Obviously, the environment of an Agricultural University should not be the same as the other Universities which are urban-centred with pronounced urban environment. But the environment in which agricultural education is being imparted in our urban-based Agricultural Universities is far from rural. In this regard, three disturbing aspects deserve our careful attention. First, Urban environment is quite dominant in our campuses. We appear to have promoted urban based agricultural education with urban-oriented faculty and students. Second, agricultural education has become a ladder for the personal advancement of agricultural graduates who aspire for urban based soft cushioning jobs. Many of our rural development programmes are intercepted by the urban-oriented officers who are likely to tilt the benefits of these programmes in their favour. Third, many research pursuits are likely to be designed in such
a way that it would promote the personal advancement of the researcher without any tangible benefit to the rural areas. Perhaps a detailed assessment of research projects undertaken in our Universities and National Research Institutes are likely to suggest that some of the departments of these institutions have become academic colonies for foreign institutions. This is not to discount the importance of interactions with foreign institutions, but to indicate that the resources of our institutions should not be diverted for the personal career advancement of the researchers without any tangible benefits to the rural areas.

Added to these is the imperative of ensuring meaningful existence for the depressed millions of our rural areas. If we fail to formulate an intelligent plan for preventing migration of millions of people from rural areas through the development of rural areas including the facilities for a comfortable and cultured life, fail to bridge the gap between urban habitats for a decent civilised life with durable values in fact, fail to mobilise people for development without dehumanisation. We will have to face the anger and frustration of those who have not been given adequate opportunities for development. In this regard, we need to keep in view that we are coping at the same time four revolutions - industrial revolution, agricultural revolution, revolution of science and technology, and social revolution dotted by the aspirations of the under-privileged to participate in and benefit from various development programmes. All these would warrant the urgency of evolving an appropriate design for living and new socio-economic order.

Two major points from the preceding discussion require recapitulation. First, the agricultural education of our country is confronted with the problem of deviation
from its major goal of serving the cause of rural people. To quote Hannah, one of the leading agricultural educationists, "The purpose of an effective institution of higher education in agriculture is to educate for service, experiment to solve real problems, conduct extension work to learn about problems and consummate solutions, and engage in public service so the leadership in agriculture will learn to respect it and look to it for guidance and help". We should not hesitate to confess that we have deviated a great deal from this dictum. Second, there is an apparent need for designing a better living conditions for the rural people. It is in the context of these two aspects, we need to examine the issues what are the premises and perspectives which ought to govern the reconstruction of agricultural education, and how to operationalise these premises and perspectives.

**Premises and Perspectives**

In any attempt to reconstruct and reorient agricultural education, one of the major recommendations made by the Education Commission of 1949 should be kept in view. The Commission has expressed its opinion against crowding together of thousands of undergraduate students in the main campus, and has recommended the establishment of Rural Universities comprising of a ring of small, resident, undergraduate colleges.

Since many of our Universities lack in particular the atmosphere so essential for quality education in agriculture, establishment of these small colleges in taluk headquarters could meet this requirement. These local institutions are to assume direct responsibility and responsiveness to needs of rural areas. The concept of decentralisation underlying this argument has been taken into account in the establishment of research stations. The present proposal on decentralised teaching programme
would sharpen the articulation which is relevant for useful teaching and research. Agriculture emphasises the need for connections and communications between theoretical research, practical research and farming in a given region. This would force the interactions in a given region among scientists advancing knowledge, scientists evolving technology and farmers producing farm products. Distribution of scientists among these places would provide the technological capacity so essential for the development of a given region.

The concept of small resident college suggested here is analogous to those of Community College in the U.S.A. These Colleges could be structured in such a way that the local community participates productively in its programmes and funds for the development of the College can be raised within the locality. This could be accomplished through the formation of Local Advisory Councils.

As indicated by the Education Commission of 1949, a general advancement of rural India will call for an ever increasing range and quality of skill and training. Attempts to meet the requirements have been made by Agricultural Universities through their diversified teaching programmes, in the area of Agriculture, Horticulture, Fishery, Dairy, Animal Science, Forestry, Sericulture and Marketing. These programmes, if operated at the proposed small resident Colleges, could evolve location-specific diversified farming akin to the Japanese Model. The curriculum could be tailored, to the extent possible, to meet the local conditions without sacrificing the need for training in some core principles and subjects.

The Youth of this Country are at cross roads. Many of them are obsessed with urban culture, discarding the great values and traditions of our country. Even in our
rural areas, decline in the values of life has surfaced
warranting the urgency of sustained efforts for rejuvena-
ting our traditional values and culture. Cultivation of
scientific temper along with commitment to the develop-
ment cause of rural areas should be effected. We want
our trained agricultural personnel not only to modernise
agriculture, but also to work with farmers without any
inhibition. We want them not to think that intellectual
skill is superior to practical skill. If agricultural educa-
tion is to be a great instrument of socio-economic
emancipation of our rural folk, decentralisation of our
teaching programme could be of help in supplying a
product that is indispensable for agriculture, viz.,
educated and dedicated man-power. This is not to mean
that all the present ailments of agricultural education
will be cured with the implementation of these proposals.
But it is only to suggest that further decline will be
avoided and students trained in rural environment are
likely to have more sympathy when they work with
rural people.
RURALISATION OF AGRICULTURAL EDUCATION FOR REGIONAL DEVELOPMENT AND SELF EMPLOYMENT

N. N. SARMAH and D. K. GOGOI *

Introduction

Agricultural education refers to organized and institutionalized instruction in agriculture, as carried out in educational establishments, including regular in-service training programmes on specific agricultural vocations and short practical courses for farmers (Anon, 1971) in India, agricultural education, as a system, started with the setting up of five agricultural colleges at Lyalpur, Pune, Coimbatore, Sabour and Kanpur on the recommendations of the Famine Commission of 1901. The idea that initiated the decisions leading to the establishment of agricultural universities came in the form of one of the important recommendations of the University Education Commission (1949), (Anon 1951) headed by Dr. Radhakrishnan. The Commission recommended establishment of “Rural Universities”. Later, the second Joint Indo-American Team (1960) headed by Dr. M. S. Randhawa recommended establishment of one agricultural university in each state. It also recommended that the Agricultural Universities be started on the pattern of Land Grant Colleges of the United States of America.

The first agricultural university in India came-up at Pantnagar (Uttar Pradesh) in 1960 and the second at Ludhiana (Punjab) in 1962. Since then the country has made significant development in this direction and at

* Assam Agricultural University, Jorhat,
present there are as many as 26 agricultural universities and quite a good number of ICAR institutions that impart agricultural education. There is no doubt that agricultural education has been made more purposeful and mission-oriented over the last three decades; but still, it has not been fully rural-oriented i.e., this has not been able to benefit the larger section of the rural population that is directly engaged in the farming profession. Such lapses will have to be removed if the fruits of modern agriculture are to be harvested to the full extent. In this regard, the agricultural education systems particularly the Agricultural Universities have huge responsibilities. As remarked by Lamba (1983), the future of agriculture and thereby human existence, will depend largely on what our agricultural universities, institutes and colleges do by way of imparting training in the fields of teaching, research and extension. The quality of teaching, research and extension, in turn, will be determined by the relevance and suitability of our agricultural education programmes.

Meaning of Ruralisation

The term ruralisation of agricultural education is used in this paper to mean orientation of the whole agricultural education system to rural situations. In other words, ruralisation is giving a rural character to the agricultural education, so that the product of the system come out not only with the needed professional competency but also with the right perspective and favourable attitude towards rural life. The ruralization may be possible by widening the scope of agricultural education and orienting the teaching-learning process to the farming situations.

Strategies for ruralisation of Agricultural Education for Regional Development and Self Employment: The objective of ruralisation of agricultural education is to
diffuse it into the rural mass of population. Obviously, it is expected that by doing so the general standard of the rural agriculture will be improved resulting in steady regional development and opening scope for self employment in agricultural and allied fields. However to carry the agricultural education nearer to the rural population certain firm strategies will have to be adopted at national as well as regional levels, some such strategies are proposed in the following paragraphs.

(i) Inclusion of agricultural subject in primary and secondary levels of education: The higher level agricultural education imparted at the College and Universities benefits only a handful of students and produces only a limited number of agricultural professionals. It cannot cover the mass of the rural population who are actually the primary beneficiaries of agricultural education. Therefore, if certain elementary courses on agriculture are included at primary and secondary levels, a larger section of students will be benefited. In fact, this is in practice in a few States like U. P., M. P., Maharashtra and Gujrat (Anon, 1971).

At primary level, agriculture may be offered as a subject or part of a subject which will arouse interest in agriculture in the minds of the young students. At secondary levels, agricultural education may be imparted as an elective subject in general high school or as one of the vocational streams in the multipurpose high schools. Some technical institutions like Vocational Agricultural Schools and Agricultural polytechnics may also provide a wide range of training in various specialised courses in agriculture.

Such lower level agricultural education will serve three-fold purposes:
1. The students who cannot undergo higher education for one or the other reason, can take up farming or allied business as their self-employment with the background knowledge of agriculture.

2. A section of the students will be encouraged to higher agricultural education and

3. Such institutions in the villages will contribute substantially in diffusion of agricultural knowledge among the rural population.

(ii) Establishment of Regional Agricultural Institutes: Recently the ICAR has launched the National Agricultural Research Project (NARP) in certain States and established a number of regional research stations for the study of regional problems of agriculture and transfer of technology to the farmers of the concerned regions. Likewise, such regional stations can impart practical training in various aspects of agriculture to the rural youths and field level agricultural workers of the region. Thus inclusion of this educational component, the RARSs can serve as full-fledged agricultural institutes and can be named Regional Agricultural Institutes (RAI). If this is found fruitful, the other crop research located at different regions may also be converted into institutes with the provision of imparting agricultural training by these regional institutes, more and more farmers and youths will be benefited which will help to a great extent in regional development of the rural youths.

(iii) Provision of rural based internship/work experience programme in B. Sc. (Agri.) curriculum: The point of inclusion of rural oriented practical training in agricultural education particularly at the undergraduate level has been emphasized in different workshops and conventions
related to agricultural education. The ICAR Review Team on Agricultural Universities (Anon 1978) conducted a useful survey to find out the nature of practical training programmes offered at different agricultural universities of the country. The team observed that the crop production course was the main programme of practical training in most of the universities. The programmes like Earn While You Learn, Work Experience, Extension Method Course etc., were found to be in practice only in a few universities. The non-inclusion of rural oriented practical courses in the agricultural education system led to the production of mostly the so called "elite" graduates with little mental inclination towards the rural agricultural situations. This point was also reflected in the Deans, Committee Report (1981) which suggested two major areas in teaching practical agriculture:

(i) Practical skill training in farm production, and

(ii) Supervised work experience in agriculture under village conditions.

The first area has been incorporated in the undergraduate curricula of most of the Agricultural Universities. But the second one, although in existence in one form or other, in its truest, it has been adopted only by a few agricultural universities. The Andhra Pradesh Agricultural University, Hyderabad took the lead in introducing a Rural Agricultural Work Experience Programme in 1981. Subsequently, a few other universities have started such a programme. The National Workshop on Rural Agricultural Work Experience Programme held at Tirupati in September, 1986 recommended to incorporate such a programme in the undergraduate curricula of all the agricultural universities of the country. Such a programme will definitely improve the professional competence of the agricultural graduates.
and at the same time will develop right perspective towards the real farming situations.

Also this will develop confidence in the minds of the agricultural graduates to take up farming as a self employed business. Moreover, the presence of even one or two such self employed farmer in a locality will surely accelerate the diffusion of scientific agricultural technology in the surrounding areas.

(iv) Inclusion of courses of regional importance:
The Association of Indian Agricultural Universities, in a number of its conventions has recommended the uniformity of course contents in all universities of the country. While this is desirable to maintain the standard of the agricultural education, it is equally important to include courses of regional importance. Some universities have already introduced elective course to cater to the needs of the regions in which the graduates would find employment. As for example, the Assam Agricultural University, Jorhat offers both elective and postgraduate courses on Tea Husbandry and Technology which gives the graduates employment opportunity in the Tea Industry of the region. Similarly, other areas of regional importance may be identified and suitable courses offered both at U.G. and P.G. levels by the different agricultural universities to promote manpower development for the regional needs.

Conclusion
It has been focussed in the foregoing paragraphs that the present system of agricultural education has not been satisfactorily rural biased and failed to turn out practical-oriented trained personnel. The agricultural education has not come as close to the farming communities as it should have been. This may be one of the
causes for slow regional development in many parts of the country.

With the alarming problem of unemployment in the country, the agricultural education is expected to produce such trained personnel who can arrange self employment in agriculture and allied areas. For fulfilling these objectives, ruralisation of agricultural education by the strategies already proposed may help to a great extent.

References
India is basically a country of villages and almost all the rural population depends on agriculture for its livelihood. Although claims have been made on India's self-reliance in food production, it is commonly seen that many people do not get even one square meal a day. Besides, unemployment or under-employment is ever increasing at an alarming rate. Now, accelerating agricultural growth with efficient and fuller utilization of our agricultural resources includes training and employment of our expanding rural work force, specially while making adjustments between conflicting needs of agriculture and other sectors of economy.

Among several approaches, agricultural education is the foremost one which can transform the whole rural set up and help in solving the unemployment and underemployment problems to a greater extent. Although every state has one or more Agricultural Universities and development departments like Departments of Agriculture, Horticulture, Sericulture and Animal Husbandry, a majority of rural mass is not exposed to the higher levels of technology in various fields of agriculture.

Many of those graduating from the universities at present seek employment in Government departments, Banks and other Institutions. Thus many of the developments and advances in agriculture and other allied fields

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are still to be fully understood and practiced by the farmers. If agricultural education is to be a great instrument in socio-economic emancipation of our rural folk, decentralisation of our teaching programmes could help in supplying technologically trained and dedicated man-power for agriculture.

Most of the farmers are not fortunate enough to provide their children with higher education. Majority of the rural students are dropouts before completing the secondary school education. Opening of agricultural schools at taluk headquarters to impart vocational training of the rural folk with a minimum literacy of read and write is a worth proposition. Duration of such vocations could be 6 to 12 months.

Introduction of compulsory or optional subject in agricultural education in rural high schools encompassing dairy, crop production, sericulture, apiculture, horticulture, poultry, agricultural engineering etc., will open doors of opportunity for the sons of the soil, to learn about the scientific farming. This should form the basis for such of the students who seek entrance to higher education in agriculture in colleges and universities.

In a developing country, groveling in abject poverty and where population explosion and rising unemployment are continuing challenges of great magnitude and complexity, educational institutions cannot remain as isolated towers unconnected with the problems and needs of the people. Emphasis should, therefore be laid on vocationalisation of agricultural education.

Most of the states have two to three colleges of agricultural education which are nevertheless insufficient to impart advanced skills and specialisations to the rural students. Opening of at least one Agricultural College
in each district headquarters can produce sufficient agricultural graduates, who can serve later on as guides and can take up self-employment also. Agricultural graduates can also be placed at various developmental positions like B.D.O., Tahsildars, Revenue Inspectors, Officers in Regulated Markets, Co-operatives, Land Banks and so on. Having an agricultural background for officials coming in direct contact with rural farmers, would help to understand the rural problems fully and thus foster rural progress.

Small agricultural research institutes may be opened to tackle the immediate local problems. The number of such institutions shall relate to the types of problems to be tackled and the research needs of a given district (location specific). Linkage between these institutes and agricultural colleges/polytechnics will be necessary to impart relevant training in skills and practices, providing vocational training in advanced skills like silkworm rearing, reeling, dairying and product manufacture, cottage industries, rabbit farming, livestock activities, mushroom growing, seed production, agricultural implements, water management, dryfarming, silviculture, to the rural mass. Agricultural polytechnics may be established in the district headquarters. Besides, existing Agricultural Research Stations and Krishi Vidya Peetas can also be transformed into these polytechnics. After completion of high school education, the students can undergo training at vocational agricultural institutes for varying duration depending on the nature of specialisation the student opts. The curriculum should be need based, socially relevant and pave the way for meaningful self-employment. Financial assistance will have to be provided to those diploma certificate holders either to improve their existing farm production, or to start altogether new farming enterprises. If these trainees are
encouraged to open various types of agricultural clinics or service centres, there will be no reason why the farming cannot be a profitable business.

Vocational training is equally important to rural women in home science, tailoring, embroidery etc., besides agriculture. The same polytechnics can serve as training centres for rural women also.

In the process of establishment of aforesaid vocational centres and colleges, the existing technical staff of various government departments like agriculture, horticulture, animal husbandry and fisheries, can be used. Thus promotion of self or wage employment will help to ease out the burden of maintaining the present strength of staff in government departments as their job of extension education will rightly be carried out at various levels of learning process. Adoption of new agricultural education system can save lot of money to the exchequers besides making the extension education system, the most effective one.

Mass media like radio and television should be extensively used for two purposes viz., to create a conducive environment and remove the apprehension in public mind that vocational education is an inferior form of education meant for the less gifted or the disadvantaged; and to impart informal education to the rural mass.

At present we are giving job oriented agricultural education which compels them to ask the state “Provide us employment”. Instead, if the rural mass is provided vocational training promoting self-employment in rural areas, then the state will have an obligation to “provide market for the agricultural produce”.

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Thus, providing agricultural education at its niche to all the sons of the soil will ensure to usher in a new era of modern scientific agriculture in India in line with the New Education Policy of 20th Century.
RURALISATION OF AGRICULTURAL EDUCATION
SYSTEM IN INDIA

T.N. PRAKASH, M.G. CHANDRAKANTH and TEJASWANI *

The concept of ruralisation of agricultural education is very much nearer to the concept of decentralised, agricultural education. At present the existing agricultural education system in India is more of a centralised nature. Here the tendencies are manifest in its location, policies, management administration and also in the very concept of research, education and extension.

Education system: The Agricultural Universities in India were started based upon the US Land-Grant institutional model. Since the fundamental features of rural life and work, of society and politics, and of the philosophy of life of these two countries are basically different, this has become inappropriate which is gradually being realised. USA, has a Land-Grant College to cater the needs of a few lakh farmers and a good majority of them are located in rural areas, unlike in India where we have only two or three agricultural colleges, most of them located in urban areas, and each covering more than a crore farmers. These features point out the locationally centralised nature of our agricultural education system. But, by changing the location of the agricultural institutions to rural areas this problem of centralised location could probably be solved. Nevertheless, the whole gamut of the problem lies within the very concept of scientific research in agriculture.

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which has got a considerable influence on the agricultural education system in India. We shall delve into this aspect further.

Centralised agricultural research concept: In recent years the role of agricultural research has greatly enlarged. Research which should have been auxiliary to the main thrust of agricultural development turned to be 'CENTRAL'. The decision of the government to focus on such research was also supported by the initiative and financial assistance of the private American Foundations (Rockefeller and Ford).

Models were sought in the recent history from American Agriculture including those from Japan and Taiwan with the slogan 'to built on the best' in order to achieve self-sufficiency in food grain production. The revolutionary model of China was however ruled out. Further the technological innovations in seeds, inputs, implements were regarded as the cutting edges of the agricultural transformation. Again such innovations were initiated in the regions favoured with fertile soil, reliable water and other factors suitable for increasing production.

The 'centralistic' attitude of the above model of research is that it preferred a 'SINGLE CENTRE' relaying the technology to the other research centres situated at lower level for just local adoption and testing. Any fundamental research has to be carried out only at the apex research centre. In the process, the participation of local cultivators, local breeders and plant scientists who might profitably contribute to such technological innovations do not seem to have been seriously considered.

There is a similar centralism in the role and power of the national administration with respect to local
communities. Development is planned to be achieved through the central administration, channeling funds and materials to select projects in the rural regions. Subsidised seed distribution, low cost irrigation water, cheap fertilizer, and subsidised tractor and machinery prices are funnelled to the ‘‘haves’’ and others with the right political links.

Exogenous and simplistic research model: In addition to this centralistic attitude, the research model is embodied with two more components adding to the severity of the problem. They are the exogenous and the simplistic natures of the research models.

The exogenous aspect was characterised, for example, by the assumption that a single research centre at the apex or at international level would be able to design and breed a small set of new varieties of a crop that would be INTRODUCED from outside and DISPLACE thousands of locally cultivated plants in the countryside. The American and Asian planners believe that through IRRI, the American Rice Technology with some assistance from earlier Japanese and Thai research could meet the needs of the varied agro-ecological regions and agrarian systems in India. The local cultivating systems built over generations by trial and error were totally ignored. As a result, India’s vast genetic diversity is destroyed and thousands of locally acclimatised rice varieties were gradually replaced by a few vulnerable ‘outside’ varieties.

In addition to this exogenous character, the constituent elements in the improved and progressive cultivating system which underlies the agricultural revolution were believed to be ‘‘SIMPLE’’ an attitude displayed earlier in the search for varietal simplicity in cultivating system.
The centralist tendencies of the current trends in agricultural research programme have unfortunately leaned towards the scientific knowledge, articulated by the American and American trained agriculturists. Such a system further postulates the generation of knowledge in centralised laboratories and research stations, ready for subsequent transfer on to farmers through field research stations. In short, the system discounts the role of the research efforts informally put forth by local farmers in devising a particular technology mix and other non-technological factors, thereby making the 'new technology' *sine-qua-non* in developmental process which is not desirable.

*Decentralisation in research:* Ruralisation of the agricultural education system basically depends upon the degree of decentralisation built upon using the indigenous experience. This is necessary to be followed (and not lead) by the exogenous science. Further, instead of a single national and/or international research centre defining the problem and approaches, the development of locally based research initiation making use of quality human capital resources, considering the local agro-ecological situations and diverse cultivating system would be more relevant and fruitful. For this purpose an entirely new agricultural education policy which takes into account of all these issues, is advocated.

*Importance of management:* The decentralisation also calls for a basic change in the inter personal and inter institutional relationship in the present agricultural research and education administration. In many institutions there appears to be a sort of 'feudal' (masterservant) relationship among the several categories of personnel. This sort of relationship which was a legendary gift of the colonial rule, does not suit the contemporary socio-economic structure. A package of management principles includes unfailing commitment to excellence in the specific fields of institution building, full respect for autonomy of the
institution and effective insulations against opportunists (individuals or groups), democracy with discipline; family relationship among the various sections of the institutions, with benevolent firmness as the guiding principle, emphasis on basic virtues of administration such as integrity, dedication, efficiency and discipline and management by objectives.
RURALISATION OF HIGHER EDUCATION IN
HORTICULTURE AND FORESTRY

R. S. MALIK and O. P. SHARMA*

Himachal Pradesh, a hilly state of India has an area of 56,019 square kilometers and a population of 4.3 million. Its different agro-climatic conditions and topography has the potentiality of successfully growing all types of fruits, off-season vegetables, flowers, and ornamental plants and forest plantations. Besides, the State produces seeds of cauliflower, cabbage, chicory, sugar beet etc. which cannot be raised in the plains. In the higher elevation of the state, a variety of medicinal and aromatic plants, mushrooms, spices, condiments, wild species of some fruits, honey bees are available which can be domesticated for cultivation.

This potential of the State enabled the planners to start a new University of Horticulture and Forestry at Solan. The task of meeting the special demands of orchardists, vegetable growers, farmers' and foresters in relation to new technology has been entrusted to this University. This University is the first of its kind in the whole of Asia fully developed to meet the requirements of high quality education, research and extension education in the specific areas of horticulture and forestry especially for the state and country as a whole. Besides catering to the needs of education and research, a major emphasis of the University is on the transfer of latest technology to its clientele i.e. farmers.

The University has spread its activities throughout the state by establishing 10 horticultural research stations besides

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the one on the main campus. Similarly forest research station nurseries have been established in five different locations. These stations have been selected after a careful and thoughtful study of the area regarding climate, rainfall, soil type and needs of the farmers of that particular region. Different types of researches like breeding of fruit and vegetable cultivars, standardisation of rootstocks, pollination studies, nutritional trials, weed control, cultural practices, development of air cooled storages, techniques of processing and preservation, standardisation of vegetables seed production techniques, identification, development and multiplication of quick growing species of trees, collection of ornamental plants, silviculture, forest and nursery management are being conducted at these stations. Varieties found suitable have been recommended to the farmers of the regions. Plants have been raised in the nursery by these research stations, and are given to the farmers for planting.

The Directorate of Extension Education has adopted 200 farm families under Lab-to-Land programme of transferring the proven and tested technology in respect of fruits, vegetables, bee-keeping, mushroom and social forestry. Out of these 300 families, 150 families have been adopted on the main campus and 30 each at every four Regional Research Stations and 15 families have been adopted at Technology Transfer Centres as well as Fruit Research Station. All these stations are working as small training centres at regional levels because farmers of the region frequently visit these stations to find out the solutions to their intricate problems. More than 32 training camps have been organised to impart training in latest technology to the farmers in different regions of the State during the year, 1986-87.

The University has started publishing a quarterly magazine "Audyaniki Evam Vaniki" for the farming community in which very useful information on Horticultural and Social Forestry have been printed. For the development and enrichment of knowledge of orchardists, Extension Bulletins have
been published and distributed to the farmers. These bulletins are very informative and provide timely information to the farmers. Talks by the scientists and highlights of activities are being organised through A.I.R. and Doordarshan. Similarly, visits of groups of farmers: Udyan Avam Vaniki Divas were organised at different research stations for educating orchardists and farmers of the Pradesh.

In the years to come, this University will spread its programmes and activities through these Regional Research Stations in a better way. It has been thought out and planned by the University that every effort should be made and no stone should be left unturned to transfer the technology to farmers at every nook and corner of the State through these research stations. Moreover, the University will play a leading role in catering to the Research and Training needs of the entire hilly regions of the country.
FIELD-BASED PRACTICAL TRAINING AND RURAL WORK EXPERIENCE IN AGRICULTURAL EDUCATION CURRICULUM

K. N. KATYAR*

Neither an individual nor a nation can survive without a sense of self confidence and pride. It appears that very few people know that as Indians, they have a great deal in their past and present to justify their feeling equal to anyone in the world and striving to match their performance with the very best people in the developed countries. India, obviously cannot enter the twenty first century with a bowl-in-hand psychology. However, there is a strong feeling in the country that the mass of young people leaving schools, colleges and universities continue to regard manual activity and field work as something inferior to the most routinised clerical work. Developed countries have moved far away from such inhibitions and Indians too must shed such outmoded notions. This can be achieved only by ensuring that no one will be able to complete his schooling without having to work usefully with his hands and imbibing the concept of dignity of labour. The committee on Agricultural Universities also highlighted the weakness in terms of practical training in the agricultural education curricula of many agricultural universities.

All those concerned with Agricultural Education in India prior to the establishment of the first Agricultural University in the country in the year 1960, at Pantnagar, also had a feeling that the graduates turning out from the colleges were not fully proficient in field aspects of agricultural production.

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Although, the colleges did attempt to relate teaching in the class rooms with practical experience in the field in one or the other aspects of farming, the same could not provide a whole integrated experience of farming to the student. The College of Agriculture of the G. B. Pant University of Agriculture and Technology (then U.P. Agricultural University), Pantnagar recognized the need to teach the students "The concept of dignity of labour" and impart field-based practical training and introduced a unique Practical Crop Production (PCP) course as an integral part of the B.Sc. Ag. & A. H. degree curriculum. The course was offered for the first time in 1962-63 academic session, when the first batch of students (admitted in 1960) entered their final year. The students were also exposed to rural working conditions. I would like to share with you our experiences and suggest measures to make them effective part of Agricultural Education Curriculum.

A. Practical Crop Production at Pantnagar

This field-based practical training course is designed to meet the following objectives:

1. to enable students to put into practice with their own hands the scientific principles of agricultural production studied by them in several courses of the curriculum,

2. to develop students' capacity to plan and execute the agricultural operations on a given holding, making an efficient and economic use of the various resources,

3. to train students in the division of labour within a working team so that the best results could be obtained with cooperative efforts,

4. to develop the faculty of decision making and confidence in the execution of agricultural operations,

5. to create right aptitude and affinity for agriculture as a profession and

6. to enable students to earn while they learn.
Salient features of the course are as follows:

I. Organisation of the course

The practical crop production course is offered by the Department of Agronomy to the final year students of the 3-year degree programme by which time the students have required a fair background of scientific principles of agriculture and are in a position to put into practice what they have learnt. The course carries a total of 4 credits and is spread over two semesters with 2 laboratory credits (0-0-2x3) hours during each semester, thus covering the entire year (see Table I, for components of curriculum).

<table>
<thead>
<tr>
<th>Areas of study</th>
<th>Semester credits</th>
<th>% of total credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Language, Basic and Social Sciences</td>
<td>21</td>
<td>18.92</td>
</tr>
<tr>
<td>B. Core Agril. Sciences (including Ag. Engg. and Veterinary)</td>
<td>67</td>
<td>60.36</td>
</tr>
<tr>
<td>C. National Social Service and Work Programme</td>
<td>3</td>
<td>2.70</td>
</tr>
<tr>
<td>D. Practical Crop Production</td>
<td>4</td>
<td>3.60</td>
</tr>
<tr>
<td>E. Employment oriented Electrve Programme</td>
<td>16</td>
<td>14.40</td>
</tr>
<tr>
<td>Total*</td>
<td>111</td>
<td>99.98 (rounded to 100)</td>
</tr>
</tbody>
</table>

*This total does not include credits for remedial courses as under:

- Agriculture group (10+2) - 6 Credits
- Mathematics group (10-2) - 8 Credits
- Biology group (10+2) - 4 Credits
The course is conducted by a group of 4 faculty members of the Department of Agronomy, the senior most of them being designated as Incharge of the course. The instructors are rotated after every 2 years. While working as PCP instructors, the concerned staff perform normal teaching, research and extension duties although their teaching load is suitably adjusted. Each of PCP instructors takes care of 4 to 5 teams of students for day to day instructions and record of attendance.

In order to expose the students to the important features of the course, an orientation session is held at the end of their second year. Thereafter, the students are asked to form coherent teams of 8 students each. Every team is allotted 1.0 hectare of land of which 0.50 hectare is lowland and the remaining 0.50 hectare, upland. After the formation of the team, individual teams elect a leader and a deputy leader. It is the responsibility of the team leader to prepare the plan of work in consultation with his team mates, to submit the working hours put in by different members, on week to week basis, keep a record of the inputs used and finally prepare and submit the balance sheet at the end of the year.

The entire Saturday is kept free for the PCP class. The assigned hours of work are 8.00 - 12.00 hrs. and 14.00 - 17.00 hrs. The students have, however, to work even during off hours, Sundays and holidays as the urgency of field operations demands. Like any other course, the student is required to maintain a minimum of 85% attendance in this course too.

The PCP unit has the facilities of office room, stores, implement shed, bullock shed, threshing floor, pumping sets, tractors, and bullock and tractor drawn implements. A revolving fund is maintained for the procurement of seed, fertilizer, plant protection chemicals and fuels, etc. The students have to place indent for the facilities needed by them and a proper record of the same is maintained both by the student as well
as the store keeper. For smooth conduct of the course, the services of Farm Superintendent, Accounts Clerk, Store Keeper, Carpenter, Helpers, Tractor Drivers, Pump Operators, Bullock Attendants and Watchmen are available with the PCP unit.

The students have to perform all the farming operations, themselves, and the use of labourers is prohibited in the course. Earlier, even the land preparation was done by the students themselves using the bullock drawn implements but now the tractor operations are allowed. ‘Rice-wheat’ sequence for the low land situation and ‘soybean-wheat’ for the upland are being followed on the PCP plots for the last many years as there are no better alternatives.

II. Grading and Evaluation:

The approach adopted in grading students in this course is entirely different from that in other courses. The major emphasis in grading is laid on the timely completion of field operations and the level of crop yields obtained by the teams. The weightage given to different activities while grading is listed below:

a. Plan execution 30%
b. Crop yields 40%
c. Written tests 20%
d. Practical records 5%
e. Cooperation and conduct 5%

III. Profit Earned by Students

The teams are required to deposit the entire sales proceeds to the Department after the disposal of the produce at the end of each season. At the end of the year, the various teams have to submit the balance sheet showing the income and the expenditure incurred by the Department. The profit is shared by different members of the team in proportion.
to the working hours put in by them during the entire year. The students are finally issued a P.C.P. certificate showing their grade in the course and the value of profit earned by them. Outstanding teams in the past have been able to earn as high as Rs. 7,500 profit per hectare per year.

IV. The impact of the PCP course

The PCP course being conducted at the University has received wide acclaim not only from the students undergoing it but also from the academicians outside. The I.C.A.R. realized the importance of such a course in the Agricultural curriculum and recommended that the other Agricultural Universities should also conduct courses on similar lines. The real merit of the course rests in the opportunity it provides to the students to be face to face with the intricacies of the farming which requires an understanding of the scientific and technological principles apart from the art of management of farming as an enterprise. The course has been immensely successful in inculcating a sense of pride and realization of the dignity of labour apart from the necessary confidence and skill it imparted. There is keen competition among the teams to be at the top. It is so reassuring to watch our students transplanting in the puddled rice fields, harvesting, threshing and winnowing their produce and finally driving the PCP cart themselves on the way to market. It is so overwhelming a sight again to watch a tired PCP student, all in slush and mud, slowly treading towards the hostel at the end of the day's work when he cannot be distinguished from a casual labourer.

The PCP is a unique and prestigious course at the University.

B. Rural Agricultural Work Experience Programme (RAWEP) or a National Project

Practical Crop Production course outlined in the preceding paragraphs makes the agriculture graduates undergo a rigorous
field-based training for crop production by working in an environment, where professional activity is streamlined by set procedure and routine. It is felt that after acquiring working experience at the university farm, the students should be ready for 6 months (one semester) of internship in the form of Rural Agricultural Work Experience in Villages in the fourth year of curriculum. This programme would help the students in acquiring better understanding of the village environment, besides giving them an insight into the major constraints that work as stumbling blocks in the dissemination and application of new agricultural technology at a faster rate. Also through gaining work experience in the application of new farm technology in rural areas, the students would be better equipped to practice farming and extension work. It is believed that it would also motivate many agricultural graduates to stay at rural and semi-rural centres and engage in gainful self-employment.

I Organization of the Programme

The students in their fourth year of the degree programme would spend 6 months in villages selected for the purpose. Clusters of villages around the main campus and the Regional Research Centres may be selected, keeping in mind the logistic. Two-three students may be assigned to a village with a technical programme either prepared from the past experience or to be formulated in the village. However, the details of the operation of the programme have yet to be formulated.

It is felt that a greater attention is required on the part of the Indian Council of Agricultural Research for formulating and coordinating the proposed Rural Agricultural Work Experience Programme as a national project. For this purpose the ICAR may create a 'Rural Agricultural Work Experience Programme Cell' under an Assistant Director General (Education). This Cell may be assigned the following tasks.

(a) Formulation of a Model Technical Programme. There is an urgent need to develop the different components of the RAWEP. For this purpose, the ICAR may
constitute a task force to prepare a model programme to be discussed and finalized through the participation of Agricultural Universities at an ICAR sponsored National Workshop. This model programme would also include the details of the organizational set-up at the University level for effective implementation of the programme. The model programme, which should provide in-built mechanisms for incorporation of certain modifications or alterations depending upon regional needs, may include in its coverage the following subject matters:

1) Crop production including horticultural crops, dairying/poultry/fisheries.

2) Agro-economic survey of various social, economic, demographic features and other vital statistics relating to cropping pattern and resource endowment of village as well as of the selected farmers.

3) Extension Programme - encompassing such aspects as identification of agricultural problems, dissemination of technology and training of farmers for preparation of suitable farm plans for augmenting their income through better reorganization of farm business.

(b) Funding of the programme: Lack of financial support has stood as a major barrier in the implementation of practical training programme in the field. In fact due to paucity of funds practical training programme wherever in operation, is confined to the University campus itself and to that extent it is handicapped to deliver the real worth that one expects from it. Thus there is strong case to introduce internship programme for Agricultural students at undergraduate level wherein Rural Agricultural Work Experience programme can be introduced for a semester. The ICAR may provide financial support for this programme in the following form:

1) Transport to supervisory staff
2) Stipend for the student

3) Other logistic support

The success of implementing the programme will depend upon the effective supervision and vigilence of the staff associated with Rural Agricultural Work Experience Programme. It is therefore essential to provide transport facilities to the staff and accordingly provision for T. A. grant be made by the ICAR for the staff involved in this programme. Provision of stipend at the rate of Rs. 400 per month per student may be made for the duration of one semester Rural Agricultural Work Experience Programme. The internship stipend will be inclusive of all the fees and other charges of the University in addition to the expenses of transport etc. met by the student. The I.C.A.R. may devise the rules, eligibility, mode of payment, termination of internship and leave admissibility during the internship period. The I.C.A.R. may also provide logistic support to the University in the form of necessary fund for meeting out the material requirements of this programme.

(c) Monitoring and Evaluation of Programme: The student work under Rural Agricultural Work Experience Programme is required to be evaluated assigning credit on the same pattern as is followed in case of other courses offered to the student. The I.C.A.R. may also provide a 'Model Format' for evaluation of student's work under this programme. An elaborate narration of methodology for assessment as well as assignment of marks/credits to different components of the course programme should be elucidated to serve as guideline for overall evaluation of the student's work.

I.C.A.R. cell could monitor the implementation of this programme at different universities. It should evaluate the programme periodically, identify the various constraints and weak points of the whole programme and suggest the measure for improvements.
C. Components of 4-year B.Sc. (Ag.) degree curriculum

As discussed in the earlier sections, a change in the Agricultural Education Curriculum to balance it in favour of field-based practical training and rural work experience has been proposed in Table II.

**TABLE II.**

Proposed components of 4-year B.Sc. (Ag.) degree curriculum

<table>
<thead>
<tr>
<th>Areas of study</th>
<th>Semester credits</th>
<th>% of total credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Language, Basic and Social Sciences</td>
<td>25</td>
<td>16.89</td>
</tr>
<tr>
<td>B. Core Agril. Sciences (including Ag. Engg. and Veterinary)</td>
<td>75</td>
<td>50.67</td>
</tr>
<tr>
<td>C. National Social Service and Work Programme</td>
<td>4</td>
<td>2.70</td>
</tr>
<tr>
<td>D. Practical Crop Production</td>
<td>6</td>
<td>4.05</td>
</tr>
<tr>
<td>E. Employment Oriented Elective Programme</td>
<td>20</td>
<td>13.51</td>
</tr>
<tr>
<td>F. Rural Agricultural Work Experience Programme (RAWEP)</td>
<td>18</td>
<td>12.15</td>
</tr>
<tr>
<td>Total*</td>
<td>148</td>
<td>99.97 (rounded to 100)</td>
</tr>
</tbody>
</table>

*See Table 1 for credits for Remedial Courses.

Thus inducting more field-based practical work and rural work experience, facilitate the graduates to opt for self-employment with more confidence and solve the emerging problems more skillfully.
NEED-BASED AGRICULTURAL EDUCATION

M. A. Mohsin*

1. Introduction

The term ‘Education’ for Agriculture encompasses all kinds of formal education starting from the very early schooling of the child to the level when one is undergoing training at the graduate and postgraduate levels in an University. It also includes informal and non-formal education designed for those, who practise the advocation as well as for those who directly or indirectly support it in various ways. In broader perspective, at the National level, the worth of education should be judged by its impact and effectiveness as an instrument of National Development. Thus, in essence, learning, in the process of agricultural education, is for the fostering of a sense of enquiry in every individual to undertake training regarding problems of Agriculture and a desire to find solution to these problems. To sum up, in generalised terms, the Agricultural Education has the primary goal of serving the farming community through its product, processing a harmonious blend of teaching, research and extension education.

It has been realised at the national level that agriculture, as a subject be introduced even at the primary, secondary and the vocational levels, in addition to the traditional high level. This is because of the fact that in order to get desired end product, ready to serve the farming community, the shaping of the mind and attitude redirection has to be initiated at the level when the mind is very receptive and

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uncontaminated. This has to be accomplished by the introduction of agriculture to a child at a very early stage of growth, by conditioning to have a glimpse of the subject in the process of understanding the environment in which the child lives. The present paper however, aims at having a retrospection of the past endeavours in the arena of higher agricultural education with an attempt to analyse the causes of failures and short-comings, and to suggest ways and means to overcome these in the light of the new education policy as applicable to the field of Agricultural Education, along with a peripheral touch to the much debated subject of evaluation.

"The primary goals of teaching", as poined by Dr. Madhuri Shah, the then Chairman, University Grants Commission, "are still to transmit an organised body of knowledge to the student and help him to develop critical judgement. Yet, the student finds it harder and harder to cope with the complexity and rapid change that surrounds us. He is left to solve for himself, without institutional support, the formidable problem of integrating his learning, work and life, in practical action. Teaching and learning models, for the future, must integrate learning and living, the personal, the social and the political". Because learning as such has been defined as the process by which one, through his activity, becomes changed in behaviour.

2. Historical Perspective

A brief historical perspective of Agricultural Education in India reveals that just after independence it was thought proper to appoint a Commission, under the distinguished Chairmanship of late Dr. Radhakrishnan to restructure the University Education which was then really "alien implantation". Prior to independence the Universities were having the objective of serving the interest of the foreign rulers. It was the wise counsel of one of the greatest educationists
of our time, Dr. S. Radhakrishnan, that the Commission suggested the starting of "Rural Universities" to cater to the Educational needs of our countryside where the bulk of our people lived. Thus the very conception of the rural universities was born out of a concern for relevance. The rural universities were to be structured on the pattern of Land Grant Colleges of America. It was much later, around 1964, that a Joint American Team was formed and it submitted a report in 1955, which lead to the establishment of the first Agricultural University in Uttar Pradesh in 1960 which is presently known as the G.B. Pant University of Agriculture Science and Technology. Soon thereafter another Indo-American team recommended, among others, that an Agricultural Education pattern, with well defined objectives, be developed to encompass agricultural teaching from school, the multipurpose high school, through the college and the University. It was in 1964 that the Education Commission stressed interalia the importance of education for agriculture and recommended establishment of at least one Agriculture University in each state. At present every state is having at least one Agriculture University, the total being around 26. In spite of the fact that the Agriculture Universities were set up on Model Act of the Indian Council of Agricultural Research, and about similar financial assistance, the rates of their development varied a great deal. One very important factor, as opined by the National Commission on Agriculture (Anon, 1976) has been the attitude of the State Government and Department of Agriculture. The other factor was the differences in age, and the third but not the least important has been the human factor, including the quality, dedication and devotion of the Vice-Chancellor, teachers and students.

There has been regional imbalances with respect to the outturn of graduates and in this connection it is worthwhile to note that, of the total number of Agriculture Colleges in the country in the year 1968-69 about one-third were in Uttar
Pradesh alone (Anon. 1976) two out of every five candidates who were admitted were from this state. Next to Uttar Pradesh were Maharashtra and Rajasthan which accounted for two-thirds of the intake. The affiliated colleges were found to be responsible, in one way or the other, for the large number of unemployed agriculture graduates in the country.

In the interest of the states, and in the larger interest of the country, the Agricultural Colleges and Universities, before admitting students for graduation programmes must keep in view the employment avenues and overall trained manpower requirement; turning out sub-standard graduates with no employment prospects is rather criminal and this must be stopped. The answer to the ‘crisis of relevance’, in the opinion of Dr. M. Aram, Vice-Chancellor, Gandhigram Rural Institute, Tamil Nadu, is that the University should restructure the existing courses to approximate the manpower needs and start new courses which meet emerging personnel needs of the national economy, least we flood the country with unwanted graduates who are short on techniques, but long on expectations. It is much more relevant in the light of the recommendations of the Education Commission (1964-66) endorsed fully by the National Commission on Agriculture (Anon. 1976) which reads ‘for the next few years, the principal task of the agricultural universities would be to provide high level undergraduate education. The emphasis in undergraduate programme should be primarily on production or husbandry or management, extension, supply and services. For this it is essential that teaching is linked with actual farming practices. Every campus should provide, through well managed farms and production oriented enterprises, for several types of work experiences for students ‘to learn by doing’. The practical training required for either self employment or professional employment should be built into the course rather than having separate internship training programme as may be desirable and manageable in Veterinary Education.'
III. Restructuring syllabus

While restructuring the syllabus one has to be very cautious and analyse the Deans’ Committee Report submitted in 1981 (Anon. 1981). The report pleads for considering a graduate degree in Agriculture as the terminal degree aimed at producing professionals who are fit to take up agriculture as an enterprise. The degree has to be job-oriented or need-oriented rather than specialisation (subject e.g. Agronomy, Soil Science, Extension, etc.) oriented. However, certain amount of profession-oriented specialisation in the form of elective packages such as ‘crop production’, ‘plant protection’, ‘dryland agriculture’, ‘business management, cooperatives, finance and marketing’, ‘transfer of technology and communication’, ‘seed technology and production’, etc. have been provided. Emphasis has been laid on field work experience in the production of crops in the subjects of Agronomy, Horticulture and Extension Education. Courses on ‘food science and nutrition’, ‘Agriculture and National Development’ and ‘Integrated Rural Development’ have also been included. The Committee has kept enough scope for flexibility in development of courses based on location-specific situations. For Bihar Plateau courses on Dryland Agriculture, Watershed Management, Problem Soils and their Management, Horticulture Development, Agro and Social Forestry etc. have to assume special importance.

When a practical oriented or vocational training has to be imparted in any branch of knowledge, attitude redirection is to be given precedence over intellectual understanding. Acquisition of skill is to be recognised as more consequential than acquisition of knowledge. The ripening of social intelligence has to be attached primarily over the sharpening of abstract intelligence, as one of the pioneers in vocational guidance (Mohsin, 1958) puts it.

The restructured syllabus has to be broken up into convenient coherent units just as flower is analysed into calyx,
corolla, stamen, pistil, etc. Each part of a flower has a specific function to fulfill and while dealing with each part, the holistic approach should not be lost sight of. This is true for the graduate degree also. Each course and every part of the course has to be correlated all the time with the role it plays in the production of the crops; all theories have to be correlated with their practical applications. Just like a flower is not a simple sum of its parts similarly a syllabus is more than its units put together. It is a theme of integrated development, a theme whose entropy has been minimised or information content maximised by internal consistency and coherent sequencing.

The so-called Parkinson’s laws about bad syllabus are:

1. Every syllabus expands in content to suit the needs of those who frame it.

2. Every syllabus contracts in content to suit the needs of those who teach it.

3. Every syllabus changes its content to suit the needs of those who set questions upon it.

Thus meticulous care has to be taken in developing a syllabus such that the syllabus neither expands nor contracts nor changes its content, from whichever angle it is viewed.

In developing a course curriculum on rural work experience the broad objectives should be:

1. To provide opportunity to the students to live in rural areas and develop right prospective to rural life.

2. To gain first hand experience in the application of agricultural technology in the farmers fields and also to promote community activities in order to create assets and amenities in rural areas.
3. To understand and appreciate the constraints in the application of at least farm technology on the farmers' fields.

4. To develop right attitude towards farming and farming community.

5. To develop communication skills in students to do better agricultural extension work.

IV. Evaluation system

Many of the Universities imparting training under the trimester or semester system are still continuing with the internal evaluation system which is regarded as the essence of the trimester-semester system as copied from the American Universities. The objectives of continuous internal evaluation are summarised as follows (Rao, 1982):

1. To help teachers to continuously update their judgments in respect of the growth of students in the cognitive, affective and psychomotor domains.

2. To enable teachers to evaluate those attitudes and skills which cannot be tested at the end-of-course examinations.

3. To enable teachers to exercise their right to evaluate their own students. Since teaching-learning and evaluation are the basic components of an integrated process, one who teaches must also evaluate.

4. To help students to have a periodical feedback to judge their achievements and failure and to enable them to improve their performance.

5. To help students to develop their personalities more fully.

6. To encourage students and teachers to improve the process of learning.
7. To increase the reliability and usefulness of evaluation by providing a profile of students' performance on a variety of instruments over a period of time.

Unfortunately this system of evaluation is not free from pitfalls such as:

1. Lack of objectivity in some teachers.
2. Cutting of classes by students so that less course is covered.
3. Untimely holidays (genuine or created) which upset the course coverage schedule.
4. Tendency of some teachers to cover only a portion of the course.
5. Non-reliability of teachers who work under external pressure.
6. Artificial boost up of marks to avoid criticism either students or from the administration.

Under the circumstances it would appear that sooner one shifts from the trimester-semester, with internal evaluation, to the traditional system with external evaluation, better it is. But it is being observed that all the recruiting agencies, including UPSC, Banks, State PSC, etc., are adopting objective type testing to select suitable hands. If the students are not exposed to objective type teaching and objective evaluation, they will be at a tremendous disadvantage. Plus, the students and their instructors will not be able to get the very much required feedback on their progress in learning and teaching, respectively. Thus a current thinking has very strongly emerged that a well-thought-of blend of the two systems of evaluation may be the answer to remove the pitfalls. Incidentally, a study conducted by Dr. F.W. Star of Queen University Belfast, as reported by Dr. V. Natraj, Director, Research Cell, Association of Indian Universities, New Delhi (Salvaraj and Dhandapani, 1982), on various
combinations of percentage of internal and external evaluation, has revealed that 50:50 is the right proportion that produces remarkable results. Internal assessment must help assess those abilities and skills which are not capable of being assessed by the 'terminal university examination'.

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FIELD BASED WORK EXPERIENCE FOR AGRICULTURAL STUDENTS

R. R. CHOLE and G. K. SANGLE*

With the inception of new educational policy, the whole educational system is undergoing a radical change to meet the social needs of the country. Vocationalization of education is an important aspect of the effort of reorienting our educational system to meet the manpower requirement as well as employment generation. Agricultural education has a mandate to meet the requirements of 70-80 per cent population of India and hence assumes a central position in our education system. Agricultural colleges and universities basically are knowledge delivery systems. They have a function to harness human resources towards agricultural development in particular and rural development in general.

Objectives of Agricultural Education: Every educational programme, formal or non-formal, basic or advanced, is launched with certain objectives. The objectives of the programme are determined by national, regional and societal needs. The objectives, in turn guide development of course curriculum in any field of education. The needs change over a period of time and therefore curriculum development is a continuous and ongoing process.

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Sometimes we listen to a debate and arguments and counter arguments as to what an agricultural graduate should be able to perform. In fact, an agricultural graduate is not a specialist but in real terms he should best perform as a generalist in the field of agriculture. As Raman (1987) has rightly pointed out the requirements of a product from an agricultural university include:

1. Acquisition of job related knowledge and skills;
2. Broad understanding of related basic sciences and scientific methodology applicable to that;
3. Personality development with capability for logical thinking and effective self-expression;
4. Understanding of techno-economic, socio-economic and political environment;
5. Capability for management and communication of ideas effectively;
6. Innovativeness and self study to continuously improve self; and
7. Capability of assessing job requirements in spatial and functional requirements.

Curriculum should be developed to result into above learning experience on the part of a learner in agricultural education.

The first requirement for efficient planning and management of an agricultural education system is the getting of clear and compatible objectives at national and regional level as well as from one period in time to another. It can be, therefore, said an agricultural graduate should be able to meet ultimately the following goals of education:

1. Know meaningfully the ecological, biological, social, political and techno-economic environment.
2. Understanding and analysing the problems that inhibit agricultural development.

3. Suggest effective solutions to solve the problems, and

4. Possess required ability to implement the solutions.

This demands field based practical training for agricultural students. Mere awareness of existing knowledge in the field of agriculture is of no use unless one has the required skill to use that knowledge in real situation. This could only be done by imparting field based practical training to agricultural students which will make education process learning-oriented rather than teaching-oriented. Following are a few ways which will make agricultural curriculum learning-oriented.

Incentive is an important consideration in motivating students to participate in various work experience projects. Incentives can be provided by two ways: 1) By relating the success of project with economic benefit of student and 2) by relating performance of students participating in such projects with their academic achievements.

A. Work projects based on economic incentives

1. Earn while learn projects: These projects provide opportunity to earn profit in monetary terms to economically weaker section of students, population. In such projects undertaken by willing students, inputs may be provided by the educational institute in the beginning. The cost of the inputs and expenses incurred by the institute may be recorded after the produce is sold and profit given to the participating student. The projects are, of course, identified by the educational institute based on the resources available with the institute and adaptability as well as feasibility of the
projects. However, because of certain weaknesses in the projects, they sometimes result into failure and discouragement among the participating students. For ensuring success of earn while learn work projects, following corrective reforms may help to a great extent:

a) A separate cell of competent teachers may be established at university or college level to identify and plan the projects with greater feasibility and probability for higher success.

b) An independent monitoring and evaluation cell to provide information and technical support to students.

2. Crop production projects: Crop production projects are similar to the earn while learn projects with three features: a) These projects are related only to the crop production, b) the projects would be self identified by the students, and c) students independently formulate such projects and decide calendar of operations.

The inputs are supplied on loan basis and profit is shared by the institution and the participating students. The projects specially help students to acquire planning, decision-making and execution ability. The technical guidance has to be given to needy students. Here all required skills and understanding required by a farm manager can be acquired by the participating students.

3. Self chosen economic work projects: This is a similar project to earn while learn with an additional facet of giving full scope to student to choose on his own the project and implement it. Such economic projects can be time bound, small scale agricultural enterprises like, pisciculture, kitchen gardening, sericulture, bee keeping etc.
The projects are solely managed by students with minimum help from field staff or teachers. This helps in developing entrepreneurial abilities, risk bearing ability and practical skills among agricultural students.

B. Work projects based on academic incentives

Reforms in agricultural education could also be brought about by a number of field based work projects by making them the integral part of instructional programme and giving credits and grades to such work. At present as a part of course curriculum of degree programmes of agriculture, a number of practicals are given to the students. However, such practicals are done by students within four walls of laboratory or on the experimental farms. These practicals are necessary but they cannot provide for understanding of total environment of farmer and managerial abilities required by him. For this reason a number of work projects in actual field may be given. as below:

1. **Rural development agency study projects**: Agricultural development is an integral part of rural development. Hence to broaden vision of agricultural students, it is necessary that they should understand the agricultural development as a part of rural development process. The students should be given opportunity to study indepth developmental agencies such as Zilla Parishad, Panchayat Samiti, Gram Panchayat, DRDA, Multi-purpose Credit Co-operatives, Marketing Societies, and Agro-based Industries. Students should be asked to submit study project reports as a part of their regular instructional programme.

2. **Field work projects in college extension block**: College extension block serves as a laboratory for field practicals of agricultural college students. It
provides an opportunity for students to analyse the social and economic setting in which farm families profess agriculture and prepare farm production plans. Students should participate in the following activities:

1) Plan and conduct method as well as result demonstrations.

2) Organize farmers, meetings and trainings.

3) Motivate in establishing youth clubs, radio or TV, farm forums, etc.

4) Prepare posters on current topics of interest and display them in the villages.

5) Maintain an information corner and highlight important agricultural information periodically for use of villages.

6) Similarly, students should stay in the college extension block for specified period of time—may be one or two week—to study agricultural and rural development problems as well as to participate in some social service work.

C. Rural Agricultural Work Experience (RAWE)

Rural Agricultural Work Experience is well thought out, intelligently designed, an innovative and first of its kind programme that aims at imparting an intensive work experience to agricultural students. The programme has been successfully in operation in Andhra Pradesh Agricultural University, since 1980-81. All Agricultural Universities in Maharashtra have later adopted it as an integral part of undergraduate instructional programme.

The RAWE aims at exposing students to agricultural environment to understand the total situation of farmers and their problems. It also aims at understanding by
the students, the extent of adoption of improved agricultural production technology and problems for its further adoption. Final year students of B.Sc. (Agri.) degree programme stay in identified villages with given host farmers for a period of one semester. Students are grouped into batches and the batches are allotted to different research stations to work under the guidance of incharge of research station.

The success and utility of RAWE could be further increased by suitably modifying the programme in following ways:

1. A separate cell with adequate staff and facilities under the college Principal with the Head, Department of Extension as the Co-ordinator. Separate extension specialists of Associate and Asst. Professors' cadre need to be provided at KVK/ research stations to closely supervise and guide the students.

2. The Extension Specialist should act as chairman of advisory committee. Assistant Extension Specialist, incharge research station/KVK, and host farmer may work as members of advisory committee.

3. Instead of associating RAWE programme with research station, it should be associated to the KVKs.

4. A central expert committee should be established at the college level under the chairmanship of Associate Dean and Principal to suggest corrective measures for effective working of RAWE programme from time to time.

References:

Any technical degree programme is aimed to provide practical experience to students in addition to theory and practicals incorporated in the respective degree programmes. Realising this only perhaps internship is included in the courses like B.V.Sc. Similarly, for the other undergraduate degree programmes, the component of village extension work has been included. Here, the village stay practicals cover Agricultural Extension as its subject matter while in Andhra Pradesh Agricultural University the courses other than Agricultural Extension are also included and called by the name "RAWE" (Rural Agricultural Work Experience). The main purpose of such training is to provide practical experience to the students. While initiating such programmes care has to be taken to provide incentives to the students; further, the programmes should be of interest to students and its duration should not be too long. However, in order to provide more practical experience to students, to extend the benefits of such work to large number of farmers, and to make the practicals more meaningful, an attempt has been made in this paper to suggest some improvements in the village extension work organised in the College of Agriculture, Bangalore.

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Presently, the College of Agriculture, Bangalore is conducting village extension work with three courses of 0+5 credit hrs. to B.Sc. (Ag.) ; three courses of 0+4 credit hrs. to B.Sc. (Hort.) and one course of 0+3 credit hrs. to B.Sc. (Seri.) in Agricultural Extension. The village stay practicals are carried out by providing theoretical frame work to students at the camps and the practical experience at the camps by the Department of Agricultural Extension with the co-ordination of other departments of U.A.S. The duration of the camp is 21 days for B. Sc. (Ag.), 15 days for B. Sc. (Hort.) and B. Sc. (Seri.) students. The teachers offering the courses in the Department of Agricultural Extension accompany the students whenever such camps are organised in the villages. The arrangements pertaining to food, shelter etc., for the students is also the responsibility of the teachers concerned. In the camp the students are supposed to organise and to participate in extension activities related to individual contact methods, group contact methods and mass contact methods to teach farmers about agricultural technologies. The conducting of these camps is restricted to Bangalore and Kolar districts which are close to college camps. After completing the camp the students are evaluated based on their practical work as well as their performance in theoretical aspects and graded accordingly.

Some suggestions for conducting village extension work:

1. The village stay practicals should be conducted in the final trimester for all other U. G. programmes as is being done for B. V. Sc. and B. Sc. (Ag.).

2. The duration of the village stay practicals (camp period) should be for 21 days for all the U.G. degree programmes.
3. Instead of sending 50 to 60 students with a course teacher to nearby taluks of Bangalore and Kolar districts, arrangement has to be made to send the students to different districts of Karnataka in coordination with Karnataka State Department of Agriculture. For this purpose, U.A.S., may have to workout the modalities in consultation with the Department of Agricultural Extension and the officials of the KSDA.

4. The present A.E.P. operating in Karnataka may be utilized by attaching students to contact farmers and other farmers in the villages during the stay of students in the camps.

5. Selection of villages should be made on the following lines:
   a) All the districts under the jurisdiction of UAS Bangalore have to be considered.
   b) To start with, the areas nearing to the regional research stations should be thought of.
   c) The selection of villages may have to be done in consultation with A.D.A.s. A batch of 120-140 students have to be attached to the jurisdiction of an A.D.A. of any district selected. About 8-10 students should work in a village with the contact farmers and other farmers. The Agricultural Assistants, A.A.O's and A.O's of the area may be asked to help the students in carrying out their task by providing guidance.

6. The different agencies (Government and private organizations) have to be involved in conducting exhibition, campaign, and farmers training programme at the taluk level.
7. The incharge course teacher should go to the villages where students are working once in 4 to 5 days to evaluate and supervise their work.

8. Boarding and lodging should be looked after by the students themselves by taking the help of A.D.A's.

9. At the end of the camp, the A.D.A's concerned should send a report about the students' performance to the Professor of Extension. The students may be assigned about 40 per cent of the marks towards their work and behaviour in the villages.

The basic philosophy of education being to bring about the desirable behavioural changes in the people for their development, the students are provided a situation to practice what they learnt in the College. In addition they develop confidence to perform the task given to them as extension workers at later date.
It is widely recognised that the development and utilisation of human resources are the key factors of social, economic and national development. In this regard education is both an instrument and end of human resources development and utilisation. Accordingly, opportunities and facilities for the acquisition of knowledge, skills, attitudes and values necessary for personal, social and national development have to be developed and made available to every person. Our country is at a crucial juncture of implementing this ideal and of preparing the people for the emerging 21st century, which is likely to be technologically, sociologically and environmentally different from the one we are passing through presently. It is these circumstances which warrant the development of a new Education Policy which would help:

- to improve the quality of education and training offered in schools and colleges,
- to link education directly with economic, social and technological needs of the State / Region / Nation,
- to develop new educational approaches and structures for continuing and life-long education for those in service,

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to open out new facilities for educating those who could not attend formal system of learning-teaching owing to economic and other reasons.

— to explore ways of reducing educational wastage in the form of drop-outs by increasing and making visible the economic and social returns of literacy/functional literacy programme.

to provide suitable opportunities,

— for participative interaction between the different production, teaching and research sectors,

— for co-operatives and collaborative interactions between the educators, production sectors (industries) and social leaders,

— for mobility between formal and non-formal systems.

In short, the educational policy discussions which our beloved Prime Minister has initiated aims at developing suitable concepts, structures and approaches for achieving these ends. These, in short, ensure the development of a "learning Indian Society" which will keep 'growing from within' in terms of needs of development, social justice, secularism, democracy and pursuit of excellence in every sphere of activity.

Distance Education-Life Long Education

The formal system of education offers its products certain expected levels of gain and change in knowledge, skills and attitudes; it cannot offer the latest and developing new areas of study for its students. Further, the system leads to quite a number of drop outs, besides leaving untouched a large number of those who, owing to economic and other reasons, could not benefit from the formal system. It is, in these circumstances, that Distance Education and continuing (life-long) Education offer a system of complementary and alternative
education respectively to (a) the products of formal education and (b) those who could not get into formal education.

Distance Education, accordingly, may cater to the needs of:

- the products of the formal (professional) system in areas of higher learning pertinent to professional/occupational development.
- the products of the formal system in any area of interest and motivation for mobility from one profession to another related professions.
- the products of the formal general system of education in professional areas.
- literates who could not get into formal system of education.

The models of universities which have been running correspondence courses under the Distance Education/Open University concept appear to replicate the design and approach of learning-teaching offered in the 'formal' system. The formal system, owing to historical reasons, continue, to be information-centred/text book centred; the curriculum and syllabi are topic-based and examination-oriented. If the Distance Education Programme, which can potentially achieve all the ideals of education towards developing a learning society, is to be successful—

- its goals have to be set up in behavioural terms (what the learners would be able to perform/do/acquire by undergoing the programme).
- its curriculum should be flexible enough to allow for earning credits and for combining different (functionally-useful to the learners) subjects-experiences.
- its learning-teaching approaches should provide for interactive learning-centred experiences like project work, doing and learning, case studies etc.
its channels of entry, administration and evaluation allow for experimentation and change.

its system of coordination monitored and streamlined regularly in terms of helping the Distance Education achieve its goals.

The Tamil Nadu Agricultural University has proposed to start degree programme in Tamil leading to B. Ag. (Tech) under the Distance Education System for the benefit of the practising farmers who may have studied up to the S.S.L.C. The curriculum formulated under this programme is oriented towards 'Production Technologies'. Production is broadly defined to include processing, storage and marketing also which may have direct and immediate bearing on their technologies, social and economic return, while the degree programme offered in the formal system is oriented to Agricultural Science and their application to research. The syllabi for all the courses are drawn in terms of behavioural objectives, unlike the topic-based ones for the formal system. The model of learning-teaching developed is related to involve the cognitive (mental), psycho-motor (practices) and affective faculties of the learners in using the materials for 'learning and doing' or 'doing for learning' or 'doing and learning'. The orientation is not towards delivering a lecture as it is in the existing formal system and even in the radio talks delivered over the A.I.R. as part of the Open University system of a few institutions. The contact classes are conceived as opportunities for interaction and for video presentation of case studies, problems, etc. The Tamil Nadu Agricultural University has been offering Farm School on A. I. R, as a supplementary supportive education to farmers. The Tamil Nadu Agricultural University has so far offered 59 short term (three months/15 units) courses on functionally valuable courses to farmers on subjects like Banana cultivation, Rhizobial culture and upkeep of farm machineries, etc. It appears that teaching
resource materials have to be formulated in the form of Modules so that the teachers operating the Distance Education get immediate feedback on the success of the materials and develop/improve the strategies of learning-teaching. It appears these are what could make the Distance Education/Life-long Education system successful.

Utilisation of Educational Technology

The experience of Satellite Education in our country has been both positive and negative; positive it is in terms of the quality and timeliness of 'reach' and negative it is in terms of 'educational' achievements. The use of radio, T. V. interactive radio, teleconference, video lessons and satellite communication provide rich opportunities for making qualitative and quantitative improvements; however, the competencies of teachers who are to use them as means of education, have not been improved and oriented to using them appropriately and purposefully. Lacking in these competencies, the teachers operate the courses in Distance Education Programme in the 'learning teaching (face to face) methods' followed in the formal system. Soft-ware production for these programmes should be location-specific learner-specific and need-specific as far as possible. If the new Education Policy should achieve its goals, a massive effort to provide experiences and insights to teachers working at all levels in matters relating to (a) Curriculum Development (b) Resource Materials Production (c) Instructional Technology (d) Evaluation and Management of change and (e) Value orientations to make the Distance Education System succeed. There is also a need for establishing relay stations to operationalize channels of educational communication to the learners. All the Universities need to develop structures or educational cells to take care of these needs.

Man-power Planning and Distance Education

It is a moot point whether projections of technical man-power prepared at a particular point of time would hold good
at a time when new technologies are growing at a great speed. Scientists, who have studied the time gap between the development of a scientific concept and its application to production, predict that new technologies are likely to replace earlier ones once in every 2.9 years in developed countries, and in about 14-15 years in our country. In this background it appears a sound policy to develop core programmes in Science and Arts at different levels and offer them in the formal system and orienting the system of learning-teaching towards inculcating in the students abilities of analysis, synthesis, application, experimentation and self-learning. Every arising new technological education could be offered in the Distance Education Programme so that the learners from the formalised core system could easily learn the arising technologies in relation to their functional needs. Educational system organised in this form will provide for the evaluation-based variations, (b) scope for mobility of learners and teachers from the non-formal system to the formal system and between universities and institutes of research and (c) suitable instructional materials.

Learning Society

A learning society is one in which all its members recognise "learning" as an important input for survival, growth and development. The UNESCO Commission's Report (1971) describes the learning society in terms of its internal vigour and direction for the easy and harmonious development of the economic, social and technical needs. If education is to be a sound instrument for building up a "learning society" marked by its rational approaches to decision making, cooperation, social justice, secularism and excellence, its means and structures need to be different. In respect of its means, it appears that at higher levels of education, resource should be made to individual and group projects and problem-solving/phenomenon understanding/perspective building exercises have to be devised and offered. New structures like research
councils, extension education councils, extension education centres have to be developed. The curriculum and the effect of these interactive councils on the curriculum, means and methods of educational experiences are the only ways by which an institution's accountability and development to arising needs get expressed. The Tamil Nadu Agricultural University has developed these new structures and attempted to carry "education" to the "farmers" at their doorsteps, and to help in building up their perspectives relating to production, social and national welfare. If our New Education Policy should prepare the country to face the challenges of the next century - the glimpses of which are seen not only in the computer technology, bio-technology, satellite communication, information dynamics and robotics, but also in alleviation of poverty and malnutrition - every University should develop more active extension education activities and collaborate with one another in order to avoid wasteful repetitions. These activities will in due course make their research projects socially relevant besides also serving the needs of interdisci­plinary approach for integrated rural development.

Conclusion

I am happy to have been able to participate in this important regional seminar on the education policy. The Tamil Nadu Agricultural University has proposed to offer a degree Programme in Agriculture under the Distance Educa­tion Programme; it has been devised as an on-the-job functional improvement programme and not as any kind of a passport for a new job. It has proposed to offer courses in agriculture and allied subjects for training the high school teachers who are involved in vocation education. There appears a need to specifying the educational objectives of each level of educa­tion the Primary, the Middle, the High School, the Higher Secondary, the General University and the Professional University education and to provide a proper integration between these formal systems and the non-formal system
offered under Distance Education/Open University system. A need to help the Distance Education System achieve its full potentialities. We may have to develop coordination cells at the Regional/State/National levels in order to streamline and improve the working of the system.
I. The Necessity of Distance Education

A welfare society has to fulfil four major obligations associated with imparting education:

(i) Providing universal primary education to all children;
(ii) Educating illiterates and under-educated adults;
(iii) Providing opportunity for those who would desire to enhance their educational qualifications; and
(iv) Providing facilities for life-long (continuing) education.

The following difficulties stand in the way of fulfilling these obligations:

(i) Difficulty to provide institutions for formal education within the easy reach of those who want it.
(ii) Reluctance on the part of children as well as uneducated adults living in remote villages in poor socio-economic conditions, to attend schools even when they are available.
(iii) Difficulty felt by many - especially working adults to cope with the time-schedule and other requirements normally prescribed for formal studies.
(iv) Economic difficulties standing in the way of pursuing formal education (especially higher education) by poor people.

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In spite of the above problems, a welfare society has to discharge its obligations and hence if the learners cannot reach the centres of learning, instruction has to reach them at the spot where they would find it convenient to remain. Distance education thus aims at providing, from a far-off centre, education to all sections of society which require it.

II. Open University System as an Alternative System of Education

The ordinary system of education in vogue is said to be 'closed' in that it involves rigid restrictions regarding the place where and the time when education can be received as well as in the nature of the group that can receive it (e.g. minimum qualification, limitations of age, etc.). There is rigidity in the control and strategies of instruction also. This 'Closed' character stands in the way of the concept of 'Universal' and 'life-long' education. Hence, 'Open-education' with the above rigidity of conditions minimised, has been conceived as a remedy. Open University is envisaged for imparting 'Open education', at the higher level.

The concept of the open university originally emerged from the need for wide provision of adult education (a post-war trend) which was facilitated by the growth of mass media, especially the radio and television. But later, there emerged the special purpose of enabling those who could not take University degrees, do so. Open universities make use of a number of methods and media. Some of these are correspondence lessons and lessons through the radio and television. It is true that an open university can extend education to a wider section than by an ordinary university, by covering vast areas and providing education at the doorstep of anybody who is willing to accept it and also by reducing the rigidity of the controls involved.

At the same time, there are a large number of limitations and difficulties to be faced, especially in developing countries. A few are cited below.
(i) Organising lessons and making them available to all corners of the University's area of operation through the various media, especially T.V., need much expertise, rapid technological expansion and huge finance. Hence any University will find it difficult to provide effective instruction, and the economically backward candidates might find it difficult to have access to such lessons. Hence the programme is bound to remain as one for the urban population who can afford to get it, if special efforts are not made to make it available to all.

(ii) In the absence of sufficient use of the mass media, Universities will have to resort mainly to correspondence lessons. Here also producing lessons in an effective manner to suit an extremely heterogenous group belonging to widely diverse backgrounds requires skill and expertise of a high order which are just not available at present. Moreover processing of such lessons will require considerable time, which in turn will make it difficult to provide up-to-date knowledge.

(iii) One of the most serious limitations of distance education is the absence of provision for immediate feedback of results leading to diagnosis and remedial instruction, which is at the root of all effective learning. To reduce this to the minimum, assignments will have to be sent, got back, evaluated and fed back without much lapse of time. This involves a huge amount of work requiring services of trained personnel.

(iv) To complement the above learning experiences and to fill up the gaps as well as to provide face-to-face contact with instructors, frequent contact sessions have to be organised at various centres. This too involves tremendous work.
(v) Distance education cannot give practical training in complicated skills associated with professional and technical courses. As such, only courses preparing ‘generalists’ can be planned.

Keeping up the time-schedule for a vast number of candidates or to provide for a very flexible scheduling of time will cause immense organisational problems. This will, in turn lead to huge wastage of effort and money.

If the above problems are to be effectively tackled, large funds have to be invested to expand the technological facilities for expanding the provision of mass media to all parts of the country in such a way that an open university can utilise these effectively in accordance with their convenience and needs. Also, teachers for distance education have to be given special training in the production of ‘distance lessons’ and ‘assignments’ and in evaluating the candidates through a variety of techniques. Sufficient number of sub-centres that could organise and undertake the above tasks as well as contact programmes have to be provided.

III. Co-ordination of Formal and Non-formal Systems of Higher Education

Any system of education based on a set curriculum subject to evaluation of achievements at specified intervals will have to be qualified ‘formal’. Non-formal education has been described as ‘any organised, systematic educational activity carried on outside the framework of the established formal system’. The objective of the Non-formal system is to bring within its ambit, persons who cannot be brought within any system of formal education. Activities which supplement formal curricular experiences but not exactly in tune with the formal requirements can be classified as ‘non-formal’ (example for the latter is the programmes at present telecast by the U.G.C.). Even a radio lesson or T. V. lesson will come under the ‘formal’ system if it is designed as part of the
curricular experiences envisaged by the university that is imparting education.

In its pamphlet on ‘A policy framework for development of Higher Education in India’, the U.C.G. points out that if the University system has to discharge adequately its responsibilities to the entire educational system and to the society as a whole, it must assume non-formal educational extension as the third important responsibility and give it the same status as research and teaching. All universities and colleges should develop close relationships of mutual services and support with their local communities. Non-formal education must be made an integral part of the objectives and functions of the university and college.

Within the above framework, formal and non-formal programmes can be coordinated. The mass media, voluntary organisations in the near environment, co-curricular activities, etc. can be used for supplementing formal curricular programmes. But if this is to happen, thorough planning is essential. There should be some mechanism by which mass media such as the T.V. and radio and institutions such as the U.G.C. and the N.C.E.R.T. put their heads together and need-oriented programmes are developed. Instead of broadcasting or telecasting some tertiary educational material in a disjointed manner, programmes that would help effective implementation of the formal system could be planned. There should be proper scheduling of the programmes with steps taken to ensure that such programmes are made use of to the maximum possible.

For effective coordination of Formal and Non-formal System of Higher Education, every University should have a department for Non-formal Education which will be a coordinating link between the other departments of formal education and plan with them to see that the services reach all the needy groups beyond the immediate boundaries of the University. Every department in the University should have its
own programmes and plans of extension which will be coordi-
nated and serviced through the Non-formal Education Depart-
ment.

IV. Utilization of Educational Technology including Mass Media

Educational Technology aims at maximising the output of education (expected behavioural changes) by manipulating the input (pupils, curriculum, text books, etc.) in the most appropriate manner. This requires a 'systems approach' involving scientific planning, designing, executing and evaluating lessons by exploiting the environmental facilities to the maximum. For such effective instruction, audio-visual experiences of a realistic nature is of utmost importance. All mass media including radio, T.V., tape recorder, film projectors etc. could be used for the purpose. But the modern trend in educational technology is to insist more on the systematic and objective-based planning rather than on the mere use of sophisticated gadgets.

To bring about an effective and continued use of educational technology, a concentrated effort is required for (a) production of educational techniques and appropriate software and hardware in large quantities; (b) their continued improvement by research; and (c) an effective in service training for teachers in the use of appropriate techniques for instruction.

V. Need to evolve a scheme to produce indigenous software in respect of the Open University System

In the Indian context, correspondence lessons will be the most important medium for distance education in an open university system. The sophisticated hardware techniques cannot be universally utilised because of the various problems already enumerated. Hence, software in the form of reading materials, assignments, curriculum modules, learning pack-
ages, etc. will have to play the major role. But even the production of such software involves serious problems, especially in view of the very heterogenous nature of the students. There will be much diversity in terms of geographical location, socio-economic and cultural background, educational background, etc. If the software produced has to cater to the needs of the diverse interests and groups these should suit their conditions. The motivational forces also will be different because of the difference in interests, attitudes, aptitudes, etc. Hence, production of indigenous software becomes necessary. This, obviously would require trained personnel who have not only mastery of the skill for producing such materials but also understanding of the conditions and needs of the locality and people as well as the local resources available.

VI. Life-long Education as a Premise and End of the Education System

The old idea of a person being fully immersed in the educational system for some time and then remaining out of it for the rest of his life is no longer valid. Education is a life-long process. It starts with one's birth and goes on till his death and it takes place on all occasions and at all times. Life-long education is a creative process continuing throughout life which aims at integrating all kinds of learning experiences for the development of the total human personality. It marks an integrated approach to education taking an overall organic, view of the development of personality.

Life-long education takes place in the home, in the play-ground and through contact with the peers before the school age. Life-long education becomes necessary for grown ups so as to cope themselves with the changes taking place in the community as a result of certain kinds of development. The mass media such as radio, television, newspapers etc. are the major sources of life-long education.

The concept of life-long education (continuing education) emerged from the philosophy that man should be a perpetual
learner. As Tagore puts it, it is always better to drink water from a running stream rather than from a stagnant pool. The enormous explosion of scientific, technological and social knowledge also has accelerated the acceptance of this concept. If productivity and accountability are at the root of every human endeavour, knowledge has to be updated by professionals in all walks of life.

VII. What should we do to create the Learning Society

A learning society is one that takes up continuous learning either through formal or non-formal methods and media - with a will arising out of intrinsic motivation. If this is to take place, two major steps have to be ensured:

Effort to make people in all walks of life feel the need for continuing education (illiterate to acquire literacy and become socially efficient, labourers and agriculturists to become intelligent participants of the democracy as well as to produce the maximum and make life richer and more prosperous, professionals to master the modern ideas and techniques involved in their profession, the under-educated or semi-educated common man to ensure vertical social mobility by acquiring higher education etc.). Without this motivation nothing can be done. The governmental, semi-governmental and voluntary agencies, political organisations, welfare movements like co-operatives, the mass media etc. have to take up the responsibility of creating a feeling of urgency for continuous learning. In the case of professionals, updating of knowledge can be made obligatory. All sorts of encouragement should be given for the sake of reinforcement. It is to be pointed out that for creating and maintaining motivation, human interaction is much more effective than mechanical devices.

Adequate facilities and opportunities for continuous education should be provided. Even when there is a will, lack
of facilities will stand in the way of creating a learning society. Hence the efforts and resources of all agencies should be coordinated, pooled together and distributed according to needs. Planning of learning experiences suited to the needs and interests of the various categories of people is of utmost importance. The services of students in colleges and universities can be utilised to a great extent for adult education and for disseminating modern ideas among the lower strata of the social order.
CORRESPONDENCE EDUCATION PROGRAMME FOR FARMING COMMUNITY—PUNJAB EXPERIENCE

K. S. GILL *

Education has long been recognised as an important factor in the process of development. To the term formal, non-formal and informal education, the term distance education and open education have been added. The first and simplest form of distance education is correspondence education. Here the course of study prescribed by a University or institution is broken up into a number of modules, which are posted to student/trainee, who works on the material sent to him, and can obtain further guidance and clarification through writing back to the diffusing centre, and through attending the periodic contact classes/programmes organised for the participants of correspondence course. A second form of distance education is the electronic media i.e., Radio and T.V.

Distance education was given a concrete shape in 1962 with the introduction of correspondence education as a pilot project in the University of Delhi. By 1985, 29 universities for students of various degree courses and 5 agricultural universities for farming community (farmers and farm women) have introduced correspondence education in India. In order to give a spurt to distance education, the Government of India has set up the Indira Gandhi National Open University and a number of State Governments are also in the process of setting up of such

open universities. The education through correspondence proved a boon to meet the educational demands and to solve other problems of rural masses who cannot attend the regular classes. In the words of Eros (1967), "It is a method of teaching in which teacher bears the responsibility of imparting knowledge and skills to the learner who does not receive instruction orally but studies at a place and at a time determined by his individual circumstances".

The method of imparting instruction through correspondence has made the river of knowledge to flow at the doorsteps of the aspirants and of those who are deprived of getting the education due to socio-economic compulsions, geographical isolations and other reasons. In other words, through this method, the educational institutions have taken to the threshold of knowledge seekers. Recent advances in science and technology have brought changes in the pattern of living of the people. The most outstanding feature of modern society is the urge for higher and life long education. Education, whether formal or non-formal is one of the significant factors in facilitating the socio-economic development of the society. It also stands true in the domain of farm production. The productivity in farm sector is largely governed, in addition to the availability of physical inputs, by the levels of knowledge, skill and attitude of farmers towards improved agricultural technology.

Punjab Agricultural University, Ludhiana took a lead in starting a new programme to provide training in scientific agricultural and home management to the farmers and farm women through correspondence courses. This university is the first among agricultural universities in India to start a non-degree training programme for literate farmers by making use of this method of education.
It took the University to the very doorstep of the farmers/farm women. The main objective of this programme is to impart instructions on the latest agricultural and home-making technology to such literate farmers and farm ladies of the Punjab State who are unable to come to the Punjab Agricultural University, Ludhiana for long duration training courses.

The Beginning

To begin with, the University designed a course entitled “Integrated course in Agricultural Production” by enrolling about 250 farmers who were literate enough to read and write the local language—Punjabi. The course included lessons on various aspects such as agronomy, horticulture, vegetables, soils, plant pathology, entomology, farm management and farm machinery. These lessons are cyclostyled and were despatched through post-office in a given sequence. The information about the input-intensive agricultural technology was delivered at the doorstep of the farmers at much less cost to them. The course was found to be very satisfying to farmers for whom it was neither practical nor possible to participate in the formal set-up of classes at the university campus. The attempt received a tremendous response and was welcomed by them. In view of the encouraging responses received by the University, the faculty associated with it, gave more thought to chisel and systematise the curriculum in tune with their needs.

Later in the year 1974, the University also brought farm-women within its ambit by starting a correspondence course on “Home Management and Family Life”. This module included lessons on all the important aspects of home management and farm life where ladies played an important role in the rural household and farming too.
With the gradual gain in experiences in monitoring the correspondence courses, it was observed that the small and marginal farmers could not derive full benefit from the course on "Integrated Crop Production," as they operated under constraints of smaller or marginal landholdings. They needed knowledge on other related vocations also which can help them to supplement and sustain enough farm income. Thus, another module based on an exclusive course-curriculum was designed and was put in action in the year 1976 with the financial help of APRO for a period of three years. However, this programme could not be sustained with a separate identity after 1979, due to paucity of funds with the University. Later on, it was again revived on the receipt of financial support from I.C.A.R. under "Lab. to Land" project.

Curriculum Structures

The curriculum structure of each correspondence course have been designed in a manner so that the farmers and farm women get an integrated knowledge and skills, needed by them to manage their farms and homes on scientific lines. Accordingly, each course has been broken down into a set of 12 sub-units. Each sub-unit is divided into 10 to 15 lessons dealing with relevant topics. The total material given in a sub-unit is sent in the form of a booklet consisting of 60-70 printed pages and accompanied by an objective type of question paper.

With the increasing importance of the diversification of agriculture in the State, the curriculum structures which were prepared earlier separately for "General Farmers" and "Small and Marginal Farmers" have been combined together. Hence the curriculum and the course content for both the categories of farmers is the same at present.
Preparation of Lessons

Lessons under each of the sub-units of curriculum structure are written by a team of Subject-Matter Specialists on the basis of training-needs of the farmers and farm women. These are edited by the language and communication experts to ensure that the contents are technically accurate. Specific and precise, structure of sentences are simple and short and the style of writing is lucid for the trainees. The sequences of contents are so arranged that the trainees can easily understand its contents. These are written in simple Punjabi language with a minimum use of technical words. The main emphasis is given on explaining the principles and methods involved in the application and management of various farm inputs.

Efforts are made to keep all these contents relevant, self-explanatory and illustrative. These lessons are updated every year by incorporating the changes made by the University in the package of practices for cultivation of different crops grown in the State by supplying additional cyclostyled sheets. These additions and modifications, if any, are included in the text of the lessons at the time of reprinting of lessons. Apart from this, effort is also made to imbibe flexibility in the curriculum structure of these courses. For instance, the subject matter pertaining to farm forestry which did not find any place earlier in the booklet “Subsidiary Occupations”, were included in view of its growing importance and need for the farmers.

Enrolment of Trainees

The admission is open to all the farmers of Punjab, who have passed at least matriculation or equivalent examination and are actively engaged in farming. But this condition has been relaxed in the case of small
and marginal farmers and farm women. The farmers and farm-women who can read and write Punjabi can now seek admission to these courses. Applications on prescribed forms are invited once a year for each type of courses through advertisement/announcement in local newspapers, Changi Kheti—PAU magazine and regional radio and television stations. These farms are thoroughly scrutinized so that only deserving candidates who are actively involved in managing their farms and homes may get admission in the courses. The selected persons have to pay a token fee of rupees ten only as a registration. No tuition or any other fee is charged from them.

Mailing of Lessons

The lessons of a given sub-unit are mailed every month on a specified date.

Evaluation of the Trainees and Feedback

The performance of trainees is evaluated through response sheets attached with each booklet containing lessons on a sub-unit of their course sent to them monthly. The response sheet attached at the end of each booklet is carefully answered by the trainee himself after thorough study of the lessons. The trainees are required to send it back for evaluation. The evaluation results and necessary feedback are communicated to the trainees with the comments and an appreciation or a counselling letter as the case may be for facilitating better understanding of the content of the lessons.

Personal Contact Programmes

Personal contact programmes are organised twice a year for each batch of trainees to provide an opportunity to the trainees to interact face-to-face with the
subject-matter-specialists to clarify their doubts, solve problems and ensure proper comprehension of the contents of the various lessons sent to them. It also gives a chance to the specialists to meet their trainees. The first personal contact programme is organised for one day in the middle of the session at the district level with the help of Farm Advisory Service Staff of the University.

The second personal contact programme of two days duration is organised at the main campus of PAU at the end of the course where all trainees of the State enrolled for a course are invited. They have personal discussion with different experts. The whole group of the invited trainees is divided in such a manner that individualised interaction could also take place. The trainees are taken on guided-visits to the experimental area of the University.

Award of Certificates

The main objectives of these courses is not to grant academic degree but to impart instructions in agriculture and home life to the farmers and farm women respectively. The trainees who successfully complete at least nine response sheets are considered eligible for the award of certificates. These certificates are given on the last day of second personal contact programme held at the university campus at the end of the one year duration.

Achievements

Ten thousand three hundred and eleven farmers and farm women have been trained through these courses.

Research Studies Conducted

Some of the salient findings of research studies conducted on distance education in Punjab are as follows:
1. The trainees were mostly young in the age group of 20-30 years and school drop-outs who left after middle/secondary education and had small farm size up to 5 acres.

2. Majority of the trainees (about 83.30 to 90.00%) were in favour of present break-up of lessons and curriculum sub-units sent to them.

3. About 90 per cent of the trainees were in agreement with the present sequence of lessons.

4. The trainees comprehended reasonably well the content of the lessons (81.25 per cent in case of farmers and 77 per cent in case of farm women).

5. The trainees made use of information to a great extent at their farm (76.00 per cent farmers and 75 per cent in case of farm women).

6. Women and men did not differ in their mode of reading while 82.86 per cent and 82.00 per cent respectively read silently. About 11 per cent more women (80.71%) than men (70.00%) reading sitting. As regards, the time of reading 82.86 per cent of women and 62.67 per cent of men read at night with a duration of one hour 60.00 per cent and 70.67 per cent respectively.

Programme Constraints

Adequate staff and budgetary provisions are required for:

1. Production of instructional materials

2. Use of multi-media like radio, television, audio-visual cassettes, audio-cassettes etc.
3. Creation/strengthening of infrastructure at district level for providing efficient and effective face-to-face instructions between the trainees and trainers.

4. Travelling expenses of staff.

5. Organisation of refresher training courses to up-date the knowledge of the distance education staff in designing planning and monitoring of distance education programmes.
RURAL AGRICULTURAL WORK EXPERIENCE AND SELF-EMPLOYMENT

G. G. NANDAPURAKAR *

Education acts as a powerful tool for individual, regional, as well as national development. India has made rapid change in imparting agricultural education through a network of 25 Agricultural Universities, about one hundred agricultural colleges and institutions of the Indian Council of Agricultural Research. But the success of any educational programme depends upon how well the contents of the course is planned and how faithfully it is implemented?

There is a vital criticism that the students of agricultural colleges lack practical experience to work as professional agriculturists. They lack self confidence, they lack practical approach and consequently limiting their usefulness to the society in general and to the farming community in particular.

Earlier efforts
1. Crop production projects: They are initiated for efficiency opportunities to the students to develop practical skills. This is specially useful for those students who lack background of farming experiences. This programme allows students the opportunity to grow, harvest and market the produce. The produce is usually

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sold in the market and 50 per cent receipts goes to student and 50 per cent to the institution.

2. Earn while learn: These projects are implemented only for willing and economically weaker sections of the students, several difficulties are encountered in implementing these projects.

3. Self chosen economic work project: This is a similar project to that of earn while learn scheme with additional advantages of providing full scope for initiative and interest on the part of the student. Student has a freedom to choose his own project. It is solely managed by the students. The examples of such projects are like sericulture, pisciculture, kitchen gardening, etc.

4. Guided and close supervised projects: These projects provide field experience to those students who lack initiative and responsibility. The project can be completed by the students under close supervision and spot guidance e.g. preparation of dairy project, preserved foods and other consumable goods/materials/articles.

5. College Extension Block: College Extension Block acts as a field laboratory. The students are expected to conduct crop demonstration on farmers field, they have to conduct socio-economic survey of the village. They study the various institutions and organisations operating in the area. They are required to stay in the village for a period of two weeks and to arrange field days, exhibitions, conduct meetings, group discussion etc.
6. Training in farm practical: Farm practical training provides an opportunity to the undergraduate students to get training in handling of implements, livestock production and management, horticulture and landscape, vegetable crops and agricultural engineering.

7. Village practicals: In some institutes, village practicals are conducted by the Department of Agricultural Economics, Extension Education and Rural Sociology. In these practicals, students are required to collect data from a cultivators' field regarding his resources inventory, crops grown, livestock raised and inputs used. Student prepares enterprises budget of existing crops and livestock activities.

8. Rural Development Projects: The students are given an opportunity to study the institutions such as DRDA, T & V system, Panchayat Samiti, Zilla Parishad, Co-operative Marketing Societies, Credit Societies and Agro-based Industries etc.

Critical analysis of these programmes leads to the conclusion that the students lack practical knowledge and experience to work as professional agriculturist. They were not exposed to a composite programme of farm production involving all aspects. Secondly they did not have an opportunity to practice skills and to manage men, material and capital independently. It was also observed that the agricultural graduates lack the competencies in the areas of technological, managerial and communication skill.

In order to make agricultural graduate self-reliant, scientific farmer, ideal extension workers and responsible manager to manage a farm himself, it is essential to give on-farm training to these graduates on the pattern of the medical, engineering and veterinary graduates.
Dean's committee draft report 1987 had given major emphasis on the needs of practical training on campus and in the villages. In view of such observations it was felt that the production of quality graduates certainly needed rationale approach to agricultural education at initial stage. Institutional training under controlled situations would never be a substitute to practical agriculture in rural situations.

Thus, the field based realistic practical training at first degree level through (RAWE programme will go a long way in producing agricultural graduates, who will be capable of shouldering the responsibilities of contemporary agriculture with full confidence. Such practical rural agricultural work experience will provide an opportunity to the agricultural students to live in rural areas and develop appreciation for agriculture by gaining first-hand experience in the application of agricultural technology right at the farmer's field.

Therefore it is right time to incorporate the RAWE programme in course curriculum of undergraduate in all the agricultural colleges in the country. Rural agricultural work experiences should be considered as a learning experience for the student by living and working with the farmers in the real life situations. It will definitely create confidence for self-employment, which is the need of the country.
DISTANCE EDUCATION AND DEVELOPMENT

KRISHNA VALICHA *

One way of looking at distance education is to see it as a system of production of learning resources as a system of delivery of such resources. From this point of view, it can be viewed in a more or less industrial mode. Thus one can distinguish two basic aspects. These are: (1) Production of course material and (2) delivery or proliferation of such instructional materials.

Distance education is able to work within a more clearly industrial work ethos. It is a system with a very high degree of innovative potential. It would be possible to make a course relevant and thus integrate it within the socio-economic and cultural ethos of Indian society. Thus a course can be made relevant in terms of certain basic themes that offer an insight into central problems that define Indian society and also exemplify the basic struggle that distinguishes it. Thus themes of poverty, of ignorance, of neglect of the environment and of the need for professionalism take on a heightened meaning.

Thus the relevance of a course can be measured in terms of its economic and socio-cultural appropriateness to a particular society. A course must satisfy the professional needs of the people for whom it is meant. At the same time, it must also help in the developmental effort of a country. It must be seen as part of a drive

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against poverty, against ignorance, against the neglect of the environment and a positive step towards greater professionalism.

Secondly, course designing must necessarily entail — as an objective within it — a new concept of learning. The ultimate success of the open learning system would depend upon this new concept of learning and its proliferation.

Thirdly, what constitutes learning resources perhaps one could look around and explore what is available by way of instructional material. The B.B.C series 'The Ascent of Man' by Bronowski became a popular inter-disciplinary course in some American Universities. The comic strip has been made use of abroad as creative educational technology. The ideas of Einstein, Darwin, Marx and others have been translated into comic strip visuals and these have been found interestingly effective. Such a view of education gives to it a more empirical and pragmatic character. It involves the measurement of an educational system from a definite utilitarian viewpoint. This is clearly what characterises distances education where the learning resources, the methods of learning, the proliferation of such learning, etc., are matters that involve the cannons of industrial organisation and that are therefore open to public view and scrutiny. Distance education therefore is a realisation of the industrial ethos within the educational structure. And yet this industrialisation or, to use a stronger term, the mechanisation of instruction/education has the greatest revolutionary potential and not only can cater to needs that are different from each other in many radical ways but can promote a new and more perceptive love for learning. The idea of learning for its own sake or doing a university level course for the
challenge it offers is alien to Indian society. The present generation of Indians has grown up with the idea that a university degree is necessary to gain social respectability and for a job. The idea that a university course can be related to intellectual or vocational fulfilment is something that we have not known. This is perhaps not possible within the formal system with its hide bound rules and limitations. It cannot possibly offer the kind of courses that would suit individual requirement. The contemporary Indian therefore has never had a chance to savour a university course that has been tailored to his specific needs. Distance education holds that highly revolutionary promise.

In order to consider this, one may examine various cases where distance education can help professionally. For example, it may and does often happen that a person may have a high power professional job for many years and become tired of the routine. Wishing to do something more worthwhile even at lower pay, the person takes on a course under distance education. Similarly women, as it happens in India, may finish their graduation, get married and do child rearing at home. Studies have shown that such women, particularly in the cities, experience a vacuum and would like to come into the world of work and even taken on a career. In order to do so, they take a course under distance learning. Similarly, people want promotion and realise they will have to update their skills/knowledge, sometimes even start from the beginning if they have to make progress in their career. Some persons who achieve little or nothing at school want to test themselves and make up for lost educational opportunity. They just want to see if they can succeed. In short, there are various kinds of people who want to learn,
In the case of agricultural education, distance education can play a key role because bridging distance is a first requisite in the spread of agricultural education in the rural areas. In this case, distance education will have to use all channels of communication which include the postal correspondence package, audio-cassette, that through popular entertainment will convey important information. At the same time, the use of this media will have to be done professionally with well-defined objectives and through the establishment of a net-work of learning centres, both mobile and immobile. It is only then that agricultural education can become need-based.

The above needs express a search for fulfilment. This is intellectual, personal and vocational fulfilment. The concept of fulfilment through learning or through university education that only consciously opts for and that one chooses in terms of one's maturity is a revolutionary concept. It involves the idea of an evaluation of one's life in terms of learning. Thus learning is an attempt to bridge objectives of both working and living. It is therefore an educational activity without blinkers. It is a calculated, scientific and relevant kind of activity.
ROLE OF AGRICULTURAL UNIVERSITIES IN DISTANCE EDUCATION

G. PERUMAL

Distance Education for those who cannot attend the educational programmes at the University centres and short-term specialised correspondence courses for those who have already had higher agricultural education could provide opportunities for them to learn and make learning a lifelong activity.

The objective of distance education by the Agricultural Universities is to advance and disseminate learning and knowledge by a diversity of means, including the use of recommended technologies generated by the Agricultural Universities. The large segment of the farming community requires a lot of experience of modern agriculture to increase the production. The purpose of distance education is to promote the educational status of the farming community. The distance education system in the educational pattern of the country will serve to develop the standards of farmers. Education to farmers, on agriculture and allied subjects are being imparted by the Agricultural Universities at present in non-formal way. The training programmes organised by KVKs, the education through correspondence courses and air schools come under this category.

The vital requirements for the success of an open university/distance education are the quality of its academic courses and its delivery systems. If any one of the two requirements is neglected then the whole concept is likely to

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be a non-starter. Since learning cannot be confined within limits and boundaries imposed by Agricultural Universities, it has to be construed rightly as a learning throughout life, self independent learning, learning by observation and doing and so on. If this concept of learning is to be built in a society, then the non-formal education characterised by distance learning assumes significance. It is more appropriate to think of distance learning rather than distance teaching. The agricultural universities may play a vital role in distance education in order to create sufficient man-power for proper utilisation of the resources available in our country in the field of Agriculture.

The objectives of distance education of Agricultural Universities

a) to provide agricultural educational opportunities to those students who could not be accommodated in the institutions of higher learning due to impoverished socio-economic backgrounds and other limitations.

b) to realise equal agricultural opportunities for higher education for a large segment of the farming population including those in employment, women including housewives and adults, who wish to upgrade, their education or acquire knowledge and studies in various fields through the print medium (correspondence course) contact programmes - study centres and mass media.

c) to provide flexibility with regard to eligibility for enrolment, age of entry, choice of courses, methods of learning conduct of examinations and operation of programmes.

d) to offer degree courses and non-degree certificate courses for the benefit of working population in various fields of agriculture and allied areas and for the benefit of those who wish to enrich their lives for studying subjects of agriculture and allied subjects; and
e) to make provision for research and dissemination of knowledge.

Suggestions

1. Need based, self-job-oriented agricultural courses of different durations starting from 3 to 4 years may be offered through distance educations. Seed production, package programmes of various crops, dairy, kitchen gardening, poultry, sugarcane production, cotton production, plant protection, mushroom cultivation will be the courses according to the needs of the students who desire to join distance education courses.

2. The duration of courses may be decided based on the nature, quality, quantity and difficulty of content.

3. The content of the syllabus may be made afresh with the help of specialists, experts and agricultural educators.

4. Maximum utilisation of mass media - audio visual will enhance the efficiency of distance education.

Further, the KVK under the agricultural universities and ICAR will take such distance education with the help of the research stations attach to them for short courses in selected areas under the guidance of Directorate of Extension and Directorate of Research of various Agricultural Universities.
Bulk of the population in India are below the poverty line and a large percentage of the population are also illiterate. Much of the responsibility creating this condition should go to the present educational system. The beneficiaries of the present educational system are largely the upper and the middle classes, the poor and the down trodden on hardly have a passage to it. As a result, there is a growing disparity between the urban and the rural areas. The urban areas become the centre of attraction of the educated people with better job and income, while rural areas are characterised by stagnant economy and backwardness. The nation will only grow if the prospective beneficiaries of the rural population become economically viable units.

However, efforts are already on to patch up the differences between the urban and the rural areas through an educational policy that can bring about socio-economic transformation and participation in actual learning programmes directly leading to productivity. An individual will get the opportunity to receive education throughout his life according to his nature of work. In order to ensure this, educational systems have to be made more flexible, relevant, diversified and systematic with the provision of life-long and life-wise education to every individual—by shifting equal emphasis on full time, part time and own time study. The policy should be such that an individual, wherever and wherever required,

should be able to go through formal as well as non-formal modes of education. It should regard an individual as an inseparable part of the capital, investment of which would enrich the national economy. In short, human resource development in its totality should be the prime objective of the national educational policy.

Indian population basically live in villages and agriculture is their livelihood. Their concern for improving the per unit production of food grains is really very high. Sufficient technologies are also available for them to satisfy their concern. But agricultural science is taking such a rapid progress with the development of technologies in a dramatic pattern, it has become difficult for the farming population to accept the changed situation from their subsistence level. For them, agriculture becomes too scientific. A compromise at this stage would not help building up the national economy either. Therefore, agricultural work oriented education must reach each and every individual of the farming population so that the built in confusions and suspicions can be drained out and the technologies get saturated. One is sure to face a problem here also.

The illiterate population would find such education very difficult, specially those who are aged and have some pre-conceived ideas about farming based upon years of experience. This does not mean that they do not have the desire to learn, rather they welcome such education which makes their life rich and comfortable. So far as youth are concerned, they are comparatively more receptive than their elders, but their feelings and attitudes are governed by the social structure and values. Another set of people, though limited in size, are those having higher agricultural education generously contributing to agricultural production, needs a closer look. They have formal education and are professionally skilled to do their duties. But the knowledge they gained and the
knowledge actually required to attack the problems of the region they belong, do not usually coincide leaving some gaps. All these groups of people involved in agricultural production will have to be brought under different but suitable education systems so that each group can acquire requisite production-oriented professional competency.

Educational programmes for the first group of people stated above are already in operation under the banner, 'Adult Education', implemented by the government and some non-governmental organisations. Since motivation and persuasion are two important aspects of education for adults who are illiterate, face-to-face contact of the teachers and the learners is always essential. Therefore, these people should be kept out of distance education programmes. However, planning and execution of the adult education programmes should be an integral part of the extension education activities of Agricultural Universities in order to make it more systematic and result-oriented. The agencies responsible for the education of the adults so far have not succeeded in bringing about desirable changes in the farming community.

The distance education is specifically relevant to the millions of school drop-outs and those who cannot afford to have higher education. The phenomenon of drop-outs does not necessarily mean incompentence for academic studies, interruption in the normal studies may be due to economic and social stresses. Educational programmes that can give this section of the rural population, generally youth, a second chance to satisfy their hunger for education, may become a viable alternative to the formal system. Therefore, distance education has a great role to play here.

Many universities and institutes offer correspondence courses in varied areas and also have arrangement for awarding degrees and diplomas in recognition of the successful
completion of the courses by an individual. It is an important psychological need. The drop-outs are not illiterates, they have only missed the regular time span of formal education. Therefore, mentally they are not prepared to be treated as ordinary agriculturists. While motivating them to take up farming as a profession and feeding them with necessary technical know-how, provision should have to be made to give them formal recognition of the education they acquired so that they can stand in line with their peers in other professions.

Most of the drop-outs and farm helpers are observed to be in the range of class VIII and class X of school education. These educated young men belong to farming families and thereby gained relevant experience in agriculture and allied activities. What they need is basic understanding about the things they are doing and necessary tools for scientific observations which help to systematize the knowledge they are acquiring through practical experience. The emphasis of the educational programme should be on providing the theoretical base of the experiences already generated—the practical followed by theory. In this way, an opposite view, that is to say, the normal 'Theory followed by practicals' in the formal type of education, has to be adopted. When the instruction is structured so as to take advantage of the experiences, the education would be need-based and work-oriented in the true sense.

Agricultural Universities may initiate institutional-cum-correspondence courses for these groups of people. The courses may be planned phase-wise as presented below:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Name of the course</th>
<th>Duration</th>
<th>Eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic Certificate Course</td>
<td>1.5 yrs.</td>
<td>Class VIII pass</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th>Advance Certificate Course</th>
<th>A. 1.5 yrs. Basic Certificate holder</th>
<th>B. 2 yrs. High School pass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>Diploma Course</td>
<td>A. 2 yrs. Advance Certificate Holder</td>
<td>B. 3 yrs. 10+2 pass.</td>
</tr>
</tbody>
</table>

The main objective of the Basic Certificate Course is to give the learners a broad understanding of agriculture and allied fields relevant to the region. It should be able to deliver necessary knowledge to the students on basic sciences, crop husbandry, animal husbandry, economics, forestry, horticulture and other selected subjects. Emphasis should also be laid on developing the language base of the students so that they can pursue further studies through self and correspondence courses. Structuring of course contents will largely depend on the learners' own experience. Therefore, the course should comprise institutional training, direct contact and correspondence lessons. An introductory programme in the beginning of the course of 4 to 5 days will help the learners to orient with the course and its methodology.

Agricultural institutions like Regional Agricultural Research Stations, Krishi Vigya Kendras, Farm Trial Stations, Agricultural Colleges, Agricultural Farms of the government can play the role of contact points for the learners for direct contact with the instructors. The correspondence course should also have impact points with which the direct contacts should be linked. Besides, the learners may be given home assignments which will be submitted to the contact institutions for evaluation and further guidance. They have to be adequately measured in their rate of observation of the behaviour of soil, crops and livestocks they are familiar with, before initiating
instruction on those aspects. It will be of immense practical value if the learners develop their own experimental plots where they can test the acquired knowledge and reform their beliefs.

The ultimate aim of the course is self-employment of the target groups. Newly gained knowledge will build up their confidence to take decisions on farming activities. Here economics plays a vital role. Therefore, the course should enlist simple mathematical skills like calculation of the costs of inputs, returns in terms of money, interest on the loan etc. In this way they will have, at the end necessary expertise, if not sufficient, to understand their own situation. The Advance Certificate Course and the Diploma Course may be organised in the same way as in case of Basic Certificate Course. Theoretical knowledge on the practical experience of the students enrolled in these two courses, will have to be imparted in addition to minimum essential specialisation in the fields they remain engaged. The students should have to undertake extra specialised courses in a particular discipline or one of its branches of their interest to complete a Diploma Course. The Advance Certificate Course and the Diploma Course will thus have more practical training in the Contact institutions.

Minimum qualifications to get enrollment into these courses are prescribed looking into the general capability of the target groups. The idea behind suggesting two sets of eligibility for the Advance Certificate Course and the Diploma Course is firstly to encourage the Certificate holders to go for further training and secondly to embrace those who are inclined to undertake such studies with or without continuing their formal education. The duration of the courses for the certificate holders should be shorter than those who are directly admitted in the respective courses, because the certificate holders will already get exposure to the types of lessons they are to undergo and also have preliminary informations on the fields of
study. For the same reason, the former will have lesser institutional training than the latter. However, institutional training will go on increasing as one moves from Phase I to Phase II to Phase III. It will be difficult to say, at this juncture as to what will be the duration of the institutional training for each course. It will depend on the course contents, number of institutions available at the region, accessibility of the students to the institution, etc. However, it will be better if the institutional part of the courses remain within the limit of three months in Phase I, five months in case of Basic Certificate holders and seven months for others in Phase II and eight months for Advance Certificate holders and one year for the others in Phase III. Improvement of the language base of the learners should get due priority in the correspondence courses. The medium of instruction should be the one prevalent in the region for Phase I and Phase II with careful insertion of the popular terms no matter if these are derivatives of other languages. In Phase III, equal emphasis should be given in English so that the diploma holders can proudly interact with people having higher education in the concerned fields.
The planning and development of extension programmes is a continuous and interrelated series of processes. The purpose of extension is to facilitate learning and action among the members of farm families and communities. Extension programme planning is conducted through a systematic sequence of actions to promote the diffusion and utilisation of science-based on indigenous knowledge. Therefore, it is utmost important to plan the extension education programme in such a manner that it takes care of everything for all round development of different groups of clients in a particular region.

Planning

Agricultural extension works to promote desired changes in a geographical area overtime. It usually assumes a systematic nature to planning by objectives, specifying targeted client groups, delineating an interrelated set of roles and professional specialisations, utilising a variety of methods to promote learning, identifying and mobilising available resources and of course a continuous upgrading of the competencies of extension personnel. Therefore, continuous involvement with the population of an area, combined with a careful monitoring of ongoing extension operations, will enable an accurate identification of the interests and needs of the people and of the programme itself. Such an identification
of interests, needs and available resources will make it possible for extension personnel and the people to agree upon programmes objectives.

Extension programmes cannot and should not try to respond to all of the interests and needs of rural people. Extension should not establish programme objectives which fall into such improper categories as specified hereunder,

a) those for which there is no knowledge base
b) those not in the public interest
c) those available to the citizens from other agencies; and
d) those which are services, not education

Some assumptions and issues in extension programme planning

Before formulating extension programme for development, some basic issues and assumptions may be kept in mind. These are:

1. Development is an endless process.
2. Ways to solve most problems and improve the quality of life of humankind, no matter where, can be found.
3. It is possible to select, organise and administer certain resources of knowledge, technology, personnel, the physical environment and teaching-learning methods to help people achieve a more desirable quality of life.
4. The knowledge and skills of professionals can be meshed with the knowledge and skills of the people to find optimum solutions to development problems and issues.
5. Change is sometimes desirable and necessary, but change for the sake of change is not always desirable. People can be helped to make wise choices
in adopting new behaviour or in preserving old and cherished ones.

6. The bases of decisions for change should not be taken lightly, but rather should be considered carefully.

7. People will usually accept new modes of thinking and doing in favour of present ones if the new ones are perceived as offering certain advantages and having sufficient aesthetic appeal.

8. Learning sometimes occurs best as a result of choice and deliberate effort to pursue that choice. Sometimes it occurs as the result of interaction within an environment or social climate conducive to incidental learning.

9. It is often possible to create opportunities and supportive socio-emotional climates to enhance the learning of new attitudes and behaviour.

10. Education can be a means of empowering people to take greater control over the course of their lives.

Extension education programme and targeted client groups

Extension programmes serve a variety of client groups, each having its own characteristics and needs. Both men and women farmers as well as rural young people, collectively and individually, constitute clientele for extension services. These farmers may have sufficient resources and capabilities to be characterised as production agriculturists, or they may be small farmers whose landholdings are comparatively small and whose market interactions are of a subsistence nature. The landless poor, men and women, who often serve as labourers or tenant farmers are also the
clients of extension and usually require special services tailored to fit their circumstances.

Rural women frequently have several roles, such as farm manager, agricultural labourer, and/or home maker. Special extension programmes have to be made for them. Again, rural youth, as future farmers and home makers also represent a special client group for extension. Central to extension programming are the needs of the people. It is an extension responsibility to translate new technology or indigenous experience into information that can be understood and applied by a large number of clients.

Extension planning process

To bring the success of implementation of various extension programmes meant for uplifting socio-cultural and agro-economic conditions of different client groups of society, proper planning is important.

Participation in the planning process

The participation of rural clientele in the development, implementation and evaluation of extension programmes has been a long standing, fundamental, guiding principle. It is a principle which represents the very essence of the non-formal, popular nature of effective extension work. And yet, there has not been a wide degree of adherence to this principle throughout the world.

Further, it is imperative that the clientele of rural farming communities be involved in the planning process to assure a proper balance of programme inputs, proper timing or sequence of those inputs, and the bridging of cognitive, social and geographic distance between more formally educated extension personnel and less formally educated clientele. All too frequently, programme inputs are determined by one agency or another without the consultation of the people themselves, and this leads to an imbalance of inputs or activities. Extension
personnel and the members of rural farming communities are often separated by different thinking and behaviour. Without the proper kind and amount of popular participation by youth and adult men and women in the planning process, it is impossible to obtain an integrated programme of services, to achieve delivery of inputs synchronized with the people's readiness for them. Only through the people's participation can cognitive, social and geographical gaps be closed.

Conclusion

Although agricultural research, education and extension obviously have a common ultimate objective, there is often little close collaboration between them. The reasons for this lack are more complex than much of the casual discussion and rhetoric around this topic would indicate. Seldom are the underlying technical, institutional, sociological and economic implications of building up such linkages confronted squarely, analysed in detail and translated into action programmes. Thus, the weak linkages between research, education and extension persist as a critical constraint on the promotion of agricultural development in general. These linkages can be strengthened through effective extension programmes planning which include broadly-educating people, making sure of the participation in the development programme, creating new job opportunities and making them self-sufficient.
DISTANCE EXTENSION EDUCATION STRATEGY
IN GUJARAT

A. O. KHER*, ASHOK A. PATEL and A. PATEL

Today extension service in India has a network of a number of large professional extension workers at national, state, district, sub-division and village levels. But, according to Parthasarathy (1987) "the pace and content of information technology that is being adopted, in Indian agriculture appear to be inadequate. Nearly 60-70% of the research findings have yet to reach the door steps of the farmers". The problem is very severe and serious in case of farmers residing in the remote areas on hills and in forests. Thus, there is still a wide gap between the available technology and its adoption by the farmers. The challenge to bridge this gap will largely depend upon the professional competence of extension administrators, policy makers and field extension workers to come up with the right answers to a great multitude of questions.

Distance extension education

Especially in the countries like India, personal contact is the best and most effective media for the extension work. But, looking to the large number of farming population residing in remotest corners of the country, the personal contact is in no way feasible to reach all of them at a time in shortest period. Hence the only way to strengthen the extension activities in remote areas; extension agency should go with the distance extension education. This system brings new hopes to learn by reducing physical, social and psychological

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distance for all those who have either missed the opportunity of education altogether or would like to undergo training and refresher course only on a spare time basis at their own pace and according to their convenience from wherever they are living.

Distance Extension Education is a new born baby in India and particularly in the field of agriculture. To eradicate the ignorance in the agricultural technology some agricultural universities started distance extension education for the peasantry. According to the Evaluation Department of Association of Indian Universities, five agricultural universities run the distance extension education programmes in the form of correspondence courses and Farm School on the AIR programme. (Anon., 1986).

The media

Through distance extension, a variety of subjects of high utility value can be transmitted to the remote population by the selection of proper media and their use in combination.

The media for distance extension can be classified as under:

<table>
<thead>
<tr>
<th>Media for distance extension</th>
<th>Audio-visual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printed</td>
<td>Audio</td>
</tr>
<tr>
<td>1. Magazines, Journals,</td>
<td>1. AIR programmes</td>
</tr>
<tr>
<td>Books, Booklets, etc.</td>
<td>1. Doordarshan programmes for peasantry</td>
</tr>
<tr>
<td>2. Popular Articles</td>
<td>2. Farm School</td>
</tr>
<tr>
<td>through Newspapers.</td>
<td>2. Video</td>
</tr>
<tr>
<td>3. Correspondence course</td>
<td>3. Cassettes</td>
</tr>
<tr>
<td>4. Telephone</td>
<td>4. T. V. Farm University</td>
</tr>
</tbody>
</table>

The present status

The present status of the use of these medias in Gujarat is presented in the following paragraphs.
(A) Printed media

The value associated with the print medium seems largely objective and independent of the nature of subject matter. It has proved largely effective in each of the cognitive effective and psychomotor domain. It is very useful to the farmers as they can refer it at any time they need by self or with the help of others in case of illiterate farmers. Hence the print media do not possess personal touch and also are not flexible to allow for dialogue (Pathak, 1986).

1. Farm magazines, journals, books, booklets, etc.

In Gujarat, the oldest farm magazine is Krushi-Go-Vidya (KGV) serving the farming community since last 39 years. Other magazines which contain farm information are: Krushi Jivan, Krushi Vigyan, Krushi Vikas, Khedut Pragati, Kisan Jyot, Kisan Jagat, Krushi Nirman, Kapas, Veterinary Digest, Kapas Ane Khedut, etc. It is obvious from the data that KGV is sound in technical aspects but poor in circulation. Efforts should be strengthened to increase the circulation.

Moreover, Gujarat Agricultural University has also started to publish "Special Issues" of Krushi-Go-Vidya since 1984 on various subjects like plant protection, poultry, animal husbandry, dry-farming and fruit and vegetable preservation. The Department of Agriculture, Gujarat State, is reaching the farmers through booklets, pamphlets since long. The Department is publishing a popular "Khedut Patrika" which is too cheap to be purchased by any farmer. As many as 300 such patrikas are published by the Department till date.

The Gujarat Agricultural University has also published various booklets on different subjects according to the needs of the farming community. The number of booklets published during last five years were 160.

Moreover, Gujarat Agricultural University has also published various books like "Khedutopayogi Sanshodhana Bhala-man", "Khariif Pakoni Kheti Paddhati", "Ghau-ni-Vaigyanik"
Moreover, it is a good sign that various books on agriculture like "Krushi Sathi", "Krushi Sandesh", "Krushi Pragati" and recently "Vaigyanik Kheti" are also published by individuals for the use of farmers. It is high-time to mention at this stage the contribution of Dr. Balakrushna Joshi, (Krushi Kavi) in presenting the technological messages (in form of Folksongs, poets, etc.) palatable to local mass. He has written nearly 20 plays on different subjects which were broadcast through All India Radio, Rajkot and Bhuj.

2. Popular articles through Newspapers

The Gujarati Newspapers are now reaching to even the remote corners of the State. But, it is sad to note that still the newspapers' contribution in transferring the latest agricultural technologies is negligible. Recently, 'Sandesh' has started to pose the general problems of the farming communities once a week. This fact reflects the unwanted situation not to give adequate coverage to agriculture sector which engaged almost 80 per cent of the State's population.

3. Correspondence courses

Here the course of study prescribed by an University Scientists for the farmers is broken up into a number of lessons/modules. The lessons, then, are posted to the registered farmers. The farmers can obtain further guidance and clarifications through writing to the diffusing centre and also through attending the periodic contact classes. There should be regular posting of the material to the learner and prompt replies to queries on the course posed by him. The Gujarat Agricultural University is also undertaking different correspondence courses and the farmers are participating with a great enthusiasm.

(B) Audio

1. All India Radio programmes for the peasantry

The main aim of the rural broadcasting in India is to provide constant flow of rural and agricultural information
about production technology in rural areas, so that listeners can learn and adopt the technology to raise production to a maximum extent. Highlighting the importance of Akashwani, Kum. Kumud Joshi, the then Minister of States for Information and Broadcasting stated that "All India Radio is the only medium which covers 90 per cent of our population and reaches the remotest corners of our country where even postal system cannot. Our programmes should be of such a quality that these may even attract common masses" (Joshi, 1981). The rural broadcast is the part of the Farm and Home Programmes of All India Radio Stations. Rural broadcasting is one of the powerful media of mass communication which is capable of informing, educating, entertaining and influencing the thought and habit patterns of its millions of listeners. It plays an important role in influencing and increasing the knowledge particularly where illiteracy level is high.

In Gujarat, there are three All India Radio Stations namely Rajkot, Ahmedabad/Baroda and Bhuj. The main agricultural programmes broadcast by these stations are 'Krishi Mahiti', 'Krushi Vikas' and 'Gamno Choro' - including Aakashwani Khedut Mandal. As per the data of All India Radio, the coverage for peasantry is only to the tune of 22 to 30 hours a month. This needs immediate attention to increase the coverage for agricultural programmes.

2. Farm School on the Air Programme

Farm School on the Air Programme was introduced by All India Radio, Rajkot since 1978-79. In this programme-farmers are registered for listening to the lessons to be broadcast on fixed time and dates. Gujarat Agricultural University Scientists and Extension Workers of Department of Agriculture are the experts to be utilised in preparing and presenting the programme. Participant farmers are given certificates. At the end of the programme the examination of the listeners farmers is taken and the prizes are given to them according to merit.
It proved very effective and farmers had participated with great enthusiasm and interest. Till today five such programmes were broadcast and 24408 farmers have participated. Out of them, 2881 farmers were appeared for examination and awarded certificates and prizes (mostly in kind) of worth Rs. 1,04,200.

Gujarat Agricultural University in coordination with All India Radio, Ahmedabad/Baroda has taken up FSOAP programme with the Mustard crop in 1986-87 (Khet et al. 1987). The format used for the same is an innovative one in a sense it has an integration of mini-exhibition, distribution of farm literature, one day training to the farmers for total transfer of mustard production technology by a team of scientists and also the group discussion between scientists and farmers, alongwith the recording of particular (lesson) message to be broadcasted through all India Radio. "Farm School on the Air Broadcast by All India Radio, Ahmedabad/Baroda (in collaboration of Gujarat Agricultural University) was supplemented by question/answer session, distribution of farm literature, one day farmers' training, organisation of relevant mini-exhibition. This was successful and worth adopting by other All India Radio Stations of the country".

3. Audio Cassettes

An obvious advantage of the audio cassettes over radio programmes is that they are under the control of the users. Learner can stop the player to take rest, make a note or can replay a difficult section. One more use of the cassettes, in the words of a learner, is: "I find the tapes very useful, particularly the discussion ones. It is definitely a 'Contact' with the staff even though it is remot (Gough and McDonald, 1981).

It is the need of the day to prepare audio cassettes on different agricultural operations synchronising the folk songs, proverbs, Dohra, etc., so that people of remotest area in
Gujarat can use at their leisure. Communication Centre of Punjab Agricultural University has prepared such cassettes on cotton and wheat crops and very well received by the farmers.

(C) Audio-visual

The researchers on the use of different senses and learning effectiveness had clearly shown that the more use of sensory organs increases the learning efficiency and remembrance. In this way the Audio-visual media has a clear advantage over printed or audio media. The audio-visual are not easy to prepare as compared to printed or audio aids. Moreover, if a discussion is to be shown through audio-visuals, it is not possible to write the "Script" for it.

1. Doordarshan Programme for Peasantry

In Gujarat, the first "Doordarshan" programme was telecasted in August '75 through PIJ Station. With the advancement of television technology in the country and the television network programmes, the 'Doordarshan' programmes are now fully established. A one or two good programmes are also telecast for the peasantry in Gujarati. Still, there is an ample scope of improving the quality of the programmes.

2. Video

The video is not very common in rural areas. There is an ample scope to have the video players at either sub-division or taluka level. The cassettes prepared specially for that particular area and a particular message, could be shown to different groups in different villages.

3. TV Farm University

Apart from the general programmes for agriculturists, some special programmes/serials on selected messages/subjects should be telecast on regular basis in an integrated manner with other medias as made in case of FSOP.
Distance Extension Education Media of the Future

1. Comuptors

With the changing socio-economic structure and increasing consciousness for quality of education there comes an area of automation and computers in education (Sharma & Garg, 1979). It has been observed that Computers Assisted Instruction (CAI) permits many learners to interact on an individual basis with teaching material stored in computers. Computer aided learning can handle many learners individually and allow them to proceed at their own pace and level of achievement. Production of mini-computers and micro-computers on a large scale may be helpful. It is possible for computers manufacturing firms to design special computers for distance education systems with suitable cost which could be afforded by the community residing in rural and remote regions. In future it would be possible to have a common computer terminal for the number of resource centres working under the distance education systems.

2. Satellite

Distance Education systems can make use of the television for providing education to the masses. This requires careful planning and management. Unplanned and ill organised programmes selected randomly may damage the whole cause. Unfortunately the present TV Programmes regarding information and education are not attracting the masses and day by day motion pictures made for commercial purposes are becoming sole basis to justify Doordarshan. National Institute of Research and Training for Distance Education, University Grants Commission, Space Application Centre, Ahmedabad, Department of Science and Technology (DST) and the Association of Indian Universities (AIU) can provide assistance to this national body in series of ways. This institute may have following departments and centres.
i) Human Resources Development for Distance Education

ii) Mass Media Resource Department

iii) Library and Documentation Development Centre

iv) Centre for Development of Self Instructional Text Materials.

v) Compuor Application Centre for Distance Education Systems

vi) Research and Survey Department for Distance Education Systems

vii) Consultancy Centre and

viii) Evaluation Unit

Distance Education Systems of the future are expected to cater to the needs and aspirations of various categories of learners with varying attitudes, aptitudes and interests on a reasonable cost with appropriate time adjustment strategy.

The Future Strategy

The Farm School on Air Programme, Correspondence Courses, TV Farm University, Local Newspapers, Video, Audio Cassettes, etc. are main forms of Distance Extension Education in Agriculture. An integrated use of all these or as many as possible forms should be made for increasing the effectiveness of the transfer of technology. The use of these medias should be on a regular basis. There should be a Department of Distance Extension Education/Communication Centre at University level (with contact centres) which may plan and co-ordinate as many media as possible with the help of Director of Agriculture, All India Radio, Doordarshan, Local Bodies of villages and other organisations. The farmers and extension workers should be registered in these cases and should be approached with the help of as many media. Distance Extension Education is a pragmatic approach of
extending education to the millions of people for whom the word 'school' would remain a distant dream for years to come. The real problem is not that we bring them all to the 'school' but to take the school to wherever they are and wherever they work.

Distance extension education at the massive level is not too distant a dream. Even if it is so, it is a dream that deserves to be real (Shah, 1986).

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EDUCATIONAL INPUT THROUGH DISTANCE EDUCATION

T. VERMA, A. MALAVIYA and SEEMA RANI*

The prominent reasons behind slow progress in different fields of national interest of India would be lack of education which has made us lagged behind in every sphere of development. The lack of imparting education to everyone does not hold implementation feasibility, due to large target group of illiterate recipients. No educational institution can ever cater to such a large widespread group through present educational system.

The differential instructional system would find extreme difficulty of adjustment, due to high level of illiteracy. Still, the gigantic problem needs to be tackled with great challenge. Of course, this would mean innovators subject matter for instruction media, highly trained technical competent instructors and new awakening among the recipients for such educational procedures.

1. Educational programmes through T.V.

Eventhough, educational programmes have been launched through television in 1961, by Delhi television centre, not much headway made in the country. Out of the 15 and odd centres which are telecasting T.V. programmes, only 8 centres are having the ETV service: ranging from forty minutes to five and odd hours transmission per week. Most of the ETV programmes are syllabus oriented. Only in the SITE containing Hindi speaking areas and for Delhi and Srinagar Primary classes, the programmes are of general enrichment nature.

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The centre for educational technology, NCERT, New Delhi is in overall command of Educational Television in the country. As far as software is concerned, it is CET that is an important agency. In respect of hardware, T.V. studies transmitting stations, earth stations at Ahmedabad and Delhi are significant. CET, New Delhi is presently engaged in training teachers in scriptwriting, which is significantly different from radio scripts and film scripts.

Television technology has great potentiality in the field of educational technology to improve teaching learning system communication by T.V. is effective because it can bring very good demonstrations and Audio-visual materials to the classroom. It facilitates the sharing of best talent by bringing the world of reality to the home and to the classroom.

2. Educational programmes through radio

In rural India where a majority of population is illiterate, the role of printed means of media becomes limited. In its place, other constituents of mass media, the radio, T.V. and films i.e. audio-visual components become more suitable for diffusing the message of development and change. Among these, radio is one of the important, cost effective media of mass communication especially for the illiterate rural audience. This medium is considered to be a credible source of information, and an authentic, trustworthy and prestigious medium of communication.

Farm women constitute an important target audience as far as broadcasting for the rural areas is concerned. There is need to educate the farm women on diverse topics related to the efficient management of the home and the farm. To further, the cause of family welfare it is desirable that improved home practices are promptly and effectively communicated to them. Women in rural areas do not have easy accessibility to receiving sets and even if they listen to radio programmes there are other constraints on account of which there is distortion in the message received.
For improving the effectiveness of radio programmes, evaluatory studies would go a long way in improving the programmes on scientific lines. A study was conducted in Haryana State by the Department of Home Science Extensions, Education HAU, Hisar in collaboration with UNICEF with the following objectives:

1) To find out the differential gain and retention of knowledge of listening groups of women; and
2) To study the pattern of flow of information within, outside the listening groups.

The study was conducted in Kathura ICDS Block of Rohtak District, Haryana. Two villages namely Lakshanajra and Chirri having fiveaganwadis each were randomly selected. Thus, total of ten listening posts were included. All the members of these listening posts who had been attending the programme regularly were included as the sample respondents. Out of the twenty six messages that were relayed, four messages comprising of two simple message that contained very few scientific terminologies and two complex messages that contained scientific terminologies which add to difficulty in comprehension and understanding were evaluated for effectiveness in the selected villages. These messages were:

- Contagious diseases in children (simple message);
- Handicap in children (complex message);
- Boils and accidents in children (simple message);
- Eye disease in children (complex message).

The study revealed that respondents had received sufficient knowledge for all the four relayed messages. The study also revealed that respondents who discussed the message within the group had gained more knowledge. Furthermore, friends and neighbours within the listening group were a frequent source of discussion with eminators. It is concluded that radio is an effective media of communication when used with discussion with eminators. Therefore, radio pro-
grammes for rural women must be used in combination with discussion to increase effectiveness of this media of communication. As a large majority of rural women audience are illiterate, repeated exposures used to be delivered.

**Suggested approaches for future implementation of distance education learning**

On the basis of several researches and personal experiences in working with rural women it is concluded that distance education for rural women, clientele would be difficult task, however not impossible. Whether it is telecast or broadcast the experience goes to suggest that effectiveness of these media used as channel for transmission of education input if combined with discussion in organised listening groups would go a long way in having an impact. The approach would definitely help in better understanding of the transmitting of the message.

Based on the findings of the studies quoted it is further suggested that repeated exposure should be given specially for the complex message so that valuable information is gained, retained and put to use. At the same time, it is important to treat messages to be transmitted with precaution so as to eliminate the complexity of the scientific information without loss of the information. Understandability of the message is largely governed by the language used. As colloquial language helps audience to catch ideas quickly, it is suggested that messages should have thorough local blending with use of colloquial language.

In order to promote distance education through mass media channel among rural women, it is essential that availability of receiving sets should be ensured. Distance education transmission calls for highly trained personnel's to edit the message thoroughly, therefore, specialised training arrangements/institutions should be opened for imparting skill training in preparation of content, its editing, recording and standardised procedures to obtain constant feedback.
STRESS ON RURAL EDUCATION WITH SPECIAL REFERENCE TO AGRICULTURE THROUGH MODERN - ADVANCED TECHNOLOGIES USING SPIN OFFS OF SPACE RESEARCH AND OTHER RECENT DEVELOPMENTS

T. V. PAVTE*

1. Introduction

Education is a social process which leads to the good life. India is geographically big, multilingual, multireligious and economically poor. Conventional methods of education have yielded minimum results for want of trained human input, infrastructural facilities to reach the far flung villages of our country. India is mainly an agricultural country and large population is concentrated in the villages. It is imperative to energise the villages to the fullest extent so that they contribute substantially to the overall national development and enrichment. Keeping these points in view an attempt has been made in the paper to suggest means by which the fruits of space technology and important advances made in communication engineering can be put into use, in propagating the advantages of green revolution to the village man towards fuller life and better employment of huge rural population.

2. Role of Agricultural Education

It is gratifying to note that the importance given to the agricultural sector during the last forty years which has made an impressive impact in agricultural production both with respect of quality and quantity. Credit goes to national planning, Agricultural Universities and well organised extension.

*Chief Project Engineer, Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay-400 076,
programmes carried out by agricultural departments in all the states. Gigantic river valley projects and improved methods of irrigation and water distribution have contributed considerably towards self-sufficiency in food in recent years. With all these achievements major problems at the village level remain unattended due to the sheer magnitude of the tremendous job. Unemployment, under employment, lack of vocational education and training for the rural population have aggravated the situation. Agricultural Universities, all over the country have conducted a number of research programmes which have yielded better seed varieties and vital management techniques. Today, the major requirement is to convey the message of the research to the agriculturist at the grass root level and train him to be self reliant and enable him to make the best use of all the modern benefits so that he would be fully self employed and lead a respectable happy life. Important role of agricultural education should aim at

i) to provide a range of programmes which respect human dignity and worth and help rural people fulfil useful roles in the community,

ii) to achieve excellence in all educational programmes connected with major field of agriculture and allied topics and in all activities which contribute to the rural population; and

iii) to enable villagers to acquire skills and knowledge and contribute to their broad personal development.

3. Needs of our villages and upliftment of rural population

In recent years, major cities and urban towns have shared the modern amenities such as protected assured water supply, sanitation, supply of consumer goods and other social benefits. Today the time has come, to take the modern amenities to all the villages of our great country. Impressive achievement
has been made with respect to the supply of electricity to the rural and agricultural sector in majority of villages. Extensive programmes have to be evolved to educate our agricultural and rural masses in the following areas:

1) Agriculture and major activities connected with it
2) Dairy
3) Drinking water facility and general sanitation (appropriate technologies)
4) Poultry activities
5) Cattle farms
6) Sheep farms
7) Piggery
8) Agricultural meteorology
9) Irrigation
10) Rural transport
11) Marketing
12) Rural banking and finance
13) Co-operative societies

All these sectors are inter-related and inter-linked. An integrated approach has been evolved so that optimum results would materialise. It is very imperative to take into consideration the existing infrastructure available. In this respect all Agricultural Universities will have to take a pivotal lead role in mission-oriented activities.

4. Methods and implementation procedures

Each agricultural university should concentrate in its geographical jurisdiction and strive hard to implement different programmes adopting an integrated approach. Distance education methods and use of remotely sensed data would enable to achieve major goals in bringing all the villages into one fold for carrying out, variety of educational programmes.
3. Audio visual programme unit which should be able to prepare programmes continuously and distribute to various villages freely with a facility of feedback for improvement.

4. Use of satellite remote sensing should be made for monitoring and management of agricultural activities which are dynamic in nature.

5. Implementation of integrated approach is essential towards overall improvement of village and the farmer in the national perspective.

6. Each agricultural university should have a committee of experts who could advise in mobilising finances, implementation and accountability.
DISTANCE EXTENSION EDUCATION IN THE UNIVERSITY OF AGRICULTURAL SCIENCES, BANGALORE

M. B. CHANNEGOWDA*, Y. KATTEPPA N. R. GANGADHARAPPA and B. S. BASAVAIAH

The University of Agricultural Sciences, Bangalore was a part of the erstwhile University of Agricultural Sciences, Karnataka which was established in 1963 as per Mysore Act No. 22 of 1963 of the State Legislature for the development of agriculture, animal husbandry and allied sciences in the State. The erstwhile University of Agricultural Sciences, Karnataka was inaugurated on 21st August, 1964 by Dr. Zakir Hussain, the then Vice-President of India.

In 1986 by an amendment to the earlier Act of the University of Agricultural Sciences brought into force by Karnataka Act No. 14 of 1986, the erstwhile University of Agricultural Sciences, Karnataka was bifurcated into two Agricultural Universities in the state, namely University of Agricultural Sciences Bangalore and the University of Agricultural Sciences Dharwad. The University of Agricultural Sciences, Bangalore has the territorial jurisdiction of 12 districts of the state namely: (1) Bangalore Urban (2) Bangalore Rural (3) Mysore (4) Tumkur (5) Kolar (6) Mysuru (7) Kodagu (8) Dakshina Kannada (9) Hassan (10) Chickmagalur (11) Shimoga and (12) Chitradurga.

The Distance Extension Education activities reported hereunder relate to the activities undertaken by the

* Training Coordinator, STU, Hebbal

197
<table>
<thead>
<tr>
<th>Sl.</th>
<th>Title of the course/farm journal/method</th>
<th>Year of initiation</th>
<th>Duration</th>
<th>Subjects covered</th>
<th>Total No. of beneficiaries as on 86-87</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Correspondence course for farmers</td>
<td>1981-82</td>
<td>3 months</td>
<td>Paddy (irrigated)</td>
<td>437 in 6 courses</td>
</tr>
<tr>
<td>2.</td>
<td>Krishi Vignana</td>
<td>1973-74 (Oct. 1973)</td>
<td>Quarterly</td>
<td>Agriculture and allied subjects</td>
<td>12,000 (every year)</td>
</tr>
<tr>
<td>3.</td>
<td>Agricultural publications</td>
<td>1967-68</td>
<td>—</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Newspaper (Daily)</td>
<td>1967-68 Every week</td>
<td>—</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Radio programme</td>
<td>1966-67</td>
<td>—</td>
<td>-do-</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Television programme</td>
<td>1986-87</td>
<td>—</td>
<td>Agriculture</td>
<td></td>
</tr>
</tbody>
</table>
erstwhile University of Agricultural Sciences, Karnataka ever since its inception in August 21, 1964 and continued by the UAS, Bangalore till 1986-87.

The activities of distance extension education of the University of Agricultural Sciences, Bangalore are summarised in Table 1 and details presented in the succeeding paragraphs.

Correspondence course for farmers

Teaching farmers through correspondence course as a method is intended to carry education to the literate section of farming population whose farm and home conditions do not permit them to leave their villages for a long time in spite of their desire to acquire knowledge on improved practices. Therefore, the University of Agricultural Sciences, Bangalore have made a modest beginning to offer correspondence course for farmers in agriculture and allied fields in August 1981 with the following specific objectives:

1. To impart practical knowledge to the enrolled farmers on specific areas relating to agriculture and other related fields.

2. To provide opportunities to the participant farmers to acquire latest knowledge in scientific agriculture to practice in their farms, and

3. To enable participant farmers to extend knowledge on scientific agriculture for the benefit of others in the farming community.

Eligibility: The correspondence course is offered to the interested farmers of Karnataka. Candidates seeking admission to any correspondence course should have passed VII standard of school education and be profi-
cient in teaching and writing Kannada. The candidates will be required to pay a fee of Rs. 20 for each course. The duration of course is three months.

Each course will be divided into a number of lessons based on the content of courses and notes on lessons will be supplied to the candidates every fortnight. Each lesson will be accompanied by a separate response sheet. Which is to be filled in by the participants and sent back to the University within the stipulated time for evaluation. The performance of the candidates shall be judged by the answers in the response sheet. Certificate will be awarded to those candidates who get more than 50 per cent of marks.

The candidates seeking admission to the correspondence course were informed that the course is not meant for gaining employment in any institution or government. The University has made a humble beginning with one course on "Scientific cultivation of paddy" from 15-8-1981. The progress achieved in offering the course on scientific cultivation of paddy to farmers is presented below:

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-82</td>
<td>42</td>
</tr>
<tr>
<td>1982-83</td>
<td>147</td>
</tr>
<tr>
<td>1983-84</td>
<td>68</td>
</tr>
<tr>
<td>1984-85</td>
<td>84</td>
</tr>
<tr>
<td>1985-86</td>
<td>60</td>
</tr>
<tr>
<td>1986-87</td>
<td>76</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>437</strong></td>
</tr>
</tbody>
</table>

In the course offered during 1981-82, farmers belonging to all the districts of Karnataka as well as a
few farmers of Andhra Pradesh and Kerala had participated. This trend is observed in subsequent courses also.

The University of Agricultural Sciences, Bangalore has planned to offer the following correspondence courses depending upon the needs of farmers:

1. Scientific cultivation of paddy
2. Scientific cultivation of ragi
3. Scientific cultivation of jowar
4. Dairy farming
5. Poultry farming and
6. Animal diseases and their control.

Krishivignana

Krishivignana, a quarterly farm journal in Kannada on agriculture and allied subjects was initiated during October 1973. Members' Annual subscription fee of Krishivignana is Rs. 2 while the life membership fee is Rs. 25. Every year Krishivignana directly reaches 12,000 political leaders, farmers institutions, officials of development departments, teachers, researchers, extension workers and officers of agricultural universities, ICAR, IARI, UGC, New Delhi and statutory libraries in India as presented hereunder.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the persons/institution</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Members of Legislative Assembly and members of Legislative Council in Karnataka.</td>
<td>450</td>
</tr>
<tr>
<td>2</td>
<td>Village, taluk and district level farmers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>institutions (a) till 1985-86</td>
<td>7500</td>
</tr>
<tr>
<td></td>
<td>in Karnataka (b) since 1986-87</td>
<td>2500</td>
</tr>
</tbody>
</table>
3. Officials of the Development Departments of Govt. of Karnataka
   a) Agriculture 3000
   b) Fisheries 100

4. Officers/teachers/researchers/extension workers of the University of Agricultural Sciences, Bangalore 200

5. Agricultural Universities outside Karnataka, within India, ICAR, and IARI New Delhi and Central UGC Libraries 200

6. Farmers subscribers
   a) Life members 300
   b) Annual members 250

   Total 12000

In Karnataka, the Krishivignana reaches persons spread over all the districts. An evaluation study of 'Krishi Vignana', a farm journal using 107 subscribers from all over Karnataka was conducted by Jayaram (1980). The study had revealed the following:

1. Krishivignana reached not only subscribers but also their relatives, friends and neighbours thus creating a multiplier effect.

2. The subscribers of 'Krishi Vignana' opined that the topics like crop production and animal husbandry were satisfactorily covered while other areas like horticulture, fisheries and sericulture were not covered to the desired extent; and
3. Use of bold letters of 14 point size, inclusion of pictures and diagrams giving economics of cultivation practices, arranging for distribution of publications through extension workers were the important suggestions offered by the subscriber farmers.

**Agricultural Publications**

Folders, bulletins, booklets, and books in Kannada are a practical means of communicating localised and specialised information to literate farmers in Karnataka. These print media are published by the University of Agricultural Sciences in collaboration with the concerned State Development Departments. The utility of folders was investigated by Siddaramaiah, Venkataramaiah and Sethu Rao (1976) and Zalki (1973). These studies included over 300 literate farmers in Karnataka for evaluating the selected farm information folders. The studies revealed the following:

1. Over two-thirds of farmers were aware of agricultural publications but only one thirds had received one or more publications during the previous one year period.

2. Majority of the farmers spend half to two and a half hours per week in reading agricultural publications and preserved all or some of the copies for future use.

3. Majority of the farmers who had seen or possess folders belonged to middle age, educated up to Primary standard had small farm, own radio set and subscribe to daily newspapers and

4. There was association between readership and mass media exposure as well as educational level of farmers.
Channegowda (1977) has in his field experiment reported that 32.3 per cent of literate farmers receiving leaflets in Bangalore district had read the leaflet on mixed crop of ragi and soyabean. The readers of leaflet had demonstrated (1) comprehension (2) recall behaviour (3) information reinforcing behaviour (4) credibility (5) attitude (6) symbolic adoption behaviour and information disseminating behaviour of the message contained in leaflet.

The belief in India is that leaflet could be used only by literate farmers is disproved by the findings of the field experiment conducted by Channegowda and Gangadharappa (1987). In the purposively selected three villages of Dharwad taluk in Karnataka State 30.45 per cent of illiterate farmers and 69.6 per cent of literate farmers had read the leaflet on rat control brought out by UAS, Bangalore. The illiterate farmers had consulted sources such as local leaders, friends, neighbours, relatives, village cooperative, village panchayat and youth club in using the leaflet. Seventeen out of 28 illiterate farmers had preserved the leaflet for future use. The findings indicate the potential for using leaflet by extension workers to influence literate farmers and illiterate farmers.

Newspaper (Dailies)

Daily Newspaper in Kannada namely (1) Prajavani (2) Kannada Prabha and (3) Samyukta Karnataka are used to provide valuable information on agriculture and allied subjects to the farmers of Karnataka. The information was presented in the form of questions and answers once in a week. This information is processed and released by the Director of Extension of the University.
Radio Programme
The teachers, researchers and extension workers of the University of Agricultural Sciences, Bangalore present information in Kannada in the form of talks, dialogue, interviews, panel discussion etc., relating to improved technologies in agriculture and allied subjects for the benefit of farmers of Karnataka. The University in collaboration with Karnataka State Department of Agriculture have participated in farm school on AIR on important crops of the State.

Television Programme
The experts of the UAS, Bangalore have used Television medium to communicate farm information to the general public.

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Communication technology has progressed by leaps and bounds in India. In the bigger cities the people perhaps, have been introduced to some of the developments, but in the remote corners of the country, there is hardly any evidence of popular awareness of the latest communication media. In the western countries, the extension workers and educationists are already using novel and modern forms of instruction. For example, the new educational delivery systems used by the Cooperative Extension Service (USA) include television, closed circuit television, cable systems to localized areas, one way informational service (teletext), interactive television (video text.) and educational teleconferencing. In U.K. the Open University is a pioneering institute in the field of educational technology. Distance education courses were offered using radio, television, video-cassettes, texts and word-processors, satellites and cable, video-discs, computer-assisted learning (CAL), audio cassettes, home-kits, telephone teaching, 'Cyclops' shared screen teleconferencing, teletext and viewdata systems (Bates, 1986).

A number of smaller Open Universities have also been established in Canada, Sri Lanka, West Germany, Spain, Israel, Costa Rica and South America, (Bates 1984 a).

1. **Audio Cassettes**: The use of audio-cassettes material complemented by the use of visuals, in appropriate style and friendly manner has proven very popular in the Open University of the U.K. (Durbridge, 1984). The method has

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been found to be motivating, stimulating and supportive and also flexible. In the context of distance education, Durbridge (1984) states that cassettes, together with the technology of cassette players, provide unique opportunities for encouraging distant students to be mentally alert as they study, and to participate in activities which will probably make their learning more effective and enjoyable, and for giving support with the whole business of studying at a distance.

Cassettes are usually presented for study in combination with visual material, in the belief that this will help listeners to concentrate on the spoken text and also provide the potential for simultaneous study activities. The visuals that can be used with audiocassettes are varied ranging from maps, charts, specimen, film-strips, tables, graphs and so on. However the audio component should be highly integrated into the main teaching text.

2. Radio: In the Open University (UK) a study of the co-relation between aspects of programme content and context, on the one hand and overall student ratings of the programmes, on the other showed that the average student rating of a particular programme can be predicted with a high degree of accuracy from a handful of observable features of the 'programme in context' which are:

- degree to which the programme utilised 'radio-vision').

- degree to which the absence of motion picture is a disadvantage i.e. television or film would have been needed (the greater the disadvantage the lower the rating)

- degree of di-actic organisation in the programme and/or the accompanying notes (the higher the degree the higher the rating).
— degree to which ‘Comprehension’ is a major aim/objective (the higher the degree the higher the rating); and

— degree to which the programme is explicitly linked to printed course material (again, the higher the degree the higher the rating) (Grunding, 1984).

3. Television: It is noted by Bates (1984 b) that in most countries broadcasting tends to be used more for “Stand-alone” or “broadcasted” continuing education rather than linked to an integrated, comprehensive distance teaching system. The three appropriate educational characteristics of broadcast television as noted by Bates (1984 b) are:

— distributional and access characteristics.

— student control aspects.

— structural and symbolic aspects.

Due to the distributional and access characteristics, i.e. universal access in the developed country, the programmes can, among other things, by using the attractive and intensive forms of presentation common to television production, increase motivation and interest in students who are otherwise generally working in isolation. Secondly it gives both learners and teachers control over the learning process. However, compared to video, broadcasts are ephemeral, cannot be reviewed, are uninterruptable and are presented at the same pace for all students. A student cannot reflect upon an idea or pursue a line of thought during a programme, without losing the thread of the programme itself. A student cannot go over the same material several times unless it is understood.

Also the way knowledge structured and presented is crucial to learning. The structure provided by the teacher,
the text-book or the television programme provides for the learner a model of the conceptual nature of the area of study. Furthermore, some forms of structure assist certain kinds of learning and thinking and inhibit others. The structure of a broadcast television programme is commonly very different from that of a text-book. For instance documentary-style case studies are a popular form of OU (Open University) broadcast. They tend to require a passive response, to be open-ended, neutral, loosely structured, and free standing...we have found students have great difficulty in using documentary programmes, in the way intended. Unfortunately, it seems that students need to be given much more guidance in how to approach documentary style programmes, before they are able to use them to develop such skills as analysis, application of abstract principles to real world situations, evaluation and generalisations (Bates, 1984b)

On the educational characteristics of television, Bates (1984b) suggests that educationally broadcast television has the following general strengths and weaknesses.

<table>
<thead>
<tr>
<th>Good for</th>
<th>Bad for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouraging individual interpretation</td>
<td>Mastery learning</td>
</tr>
<tr>
<td>Stimulating thinking</td>
<td>Feedback/self evaluation.</td>
</tr>
<tr>
<td>Providing and overview or synthesis</td>
<td>Analysis (of processes or situations)</td>
</tr>
<tr>
<td>Narrative/story-telling</td>
<td>Reflect/deep processing.</td>
</tr>
<tr>
<td>Demonstrating continuous processes</td>
<td>Storage of information</td>
</tr>
<tr>
<td>Modelling learning processes</td>
<td></td>
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<tr>
<td>Raising awareness</td>
<td></td>
</tr>
</tbody>
</table>

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The specific value of broadcast television will vary according to the context in which it is used. Complex or expensive experiments, field-visits, microscopic observations, advance technical equipment, industrial processes, a wide range of social and interpersonal interaction, drama, archive films, classroom situations, and interviews with distinguished politicians, researchers, or educationists are just some of the experiences that can be offered to students in their own home through broadcast television. However, learning from broadcast television is a difficult process for learners.

Bates (1984 b) also notes that the production cost of broadcasting tends to be high and as a medium for instruction, broadcasting, on balance, is less effective than video-cassettes and is unsuitable for a number of educational functions; also, programmes need to be broadcast at suitable time for adult learners. However, broadcast can still provide a valuable service, but it will need to be used very selectively.

Home kits: In the distance education (U.K.) home kits are used by students in their homes, or environs. Each learner has kit for his or her sole use, consisting of essential components not likely to be found at home. The home-kits complement the theoretical course units by allowing the student to observe, explore, analyse a 'real world' situation related to the topic being taught, and to try out the techniques described. The re-inforcement of the theory and the development of appropriate skills are major functions of home kits.

'The kit has to be accompanied with instructions on how to do the activity. It is usually printed text with illustration, although audio-visual material may also be used. The home kit activity is quite tightly structured so that deviation from the intended pathway and failure and frustration on
the part of the student is minimised. The home-kit is tailored to a specific course and the students can work at their own pace. The learners have continuous access to the kit, and it contributes to the 'sense of achievement' of the learner.

The major disadvantage in production of home-kit may be the cost factor, and use of it will require large resources on the part of the user agency. However the home kits have considerable potential both in the home and without, and potentially at all levels of education.

Cyclops' of the open university, U.K.

The OU's Cyclops telewriting (or audiographics) is a versatile shared-screen technology which can be used over public telephones during live teaching. The Cyclops distance teaching system is based on the conventional television set, standard audio-cassettes, micro-computer technology, and telephones and it has been developed by a research team at the Open University, (UK) since 1976 (British Prestel and Canadian Telidon are similar systems).

Computers

The benefits of computers for extension agents of the Cooperative Extension Service (USA) are: (i) analysis of clients data, (ii) computer based instruction, (iii) production of educational materials e.g. news-stories. In case of CAI (computer assisted instruction), the example of an Agent producing a learning packet for 4-H members on gardening including a computer programme, extension bulletins and written materials. Emphasised the importance for extension workers of acquiring computer literacy.

The following uses of computer for extension agents in future are suggested:

i) Production of Bulletins and Fact sheets by saving time and energy.
ii) Production of news-letters which will be transmitted electronically.

iii) Home study courses via computer.

iv) Research-creation of data base.

v) In-service training.

vi) Sharing of programme materials via computer.

vii) Sharing of Country Extension Activity Calendars of meetings etc. from a state master-calendar.

viii) Printing e.g. re-writing and rear-ranging an old publication which can then be printed in a computer in a short time.

ix) Budgeting and Forecasting.

x) Record keeping.

xi) Personnel matters, and

xii) Planning of events like the country-fair and workshops via office computer.

Designing a distance teaching system for an Agricultural University:

Under ideal condition a modern distance teaching system for an agricultural university should have the following components:

Components

a) Correspondence courses

   Course material preparation, printing/duplicating facilities, Administration Evaluation.

b) Television programmes

   Programme production Evaluation,

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c) Radio programmes: Programme production (recording)
   Evaluation.

d) Audio-cassettes: Programme production (recording).
   Administration and business (Looing & selling of cassettes etc.).
   Evaluation.

e) Computers: Production of self-instructional on packages.
   Administration and business.

f) Home-kits: Production.
   Administration and Business

g) Video-cassettes: Production (recording)
   Administration and Business.

(Independent broadcasting facilities for agricultural universities can also be envisaged).

However, under Indian conditions, it may not be possible to have all these components mainly due to resource limitations. Therefore, every agricultural university will have to plan according to its own requirements and feasibilities. Some agricultural universities have already acquired sufficient experience in running correspondence courses and also in using radio for distance and continuing education for farmers. The communication centres of the agricultural universities have to be redesigned to accommodate all the components of distance education using a systems perspective. The open university (UK) system can again be cited as an example. It was designed using a systems approach considering the various components like course production, broadcasting, sub-systems and their interdependence. A similar approach may be followed in designing integrated distance education systems for agricultural universities with various sub-systems.
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THE GTT MODEL OF DISTANCE EDUCATION

DAWOODBHAI A. GHANCHI*

In a fast-changing techno-scientific culture of the modern age, it is imperative to provide for recurrent doses of educational inputs to people engaged in a productive activity like agriculture in order to continually improve their cognitive equipment and technical competencies. Agricultural Universities in India have, over the past two decades, developed facilities for extension education whose impact is observable in the form of two revolutions, green and white. There is a significant intangible impact also on the attitudes and perceptions of the beneficiaries namely, farmers, farmworkers and even the members of their families.

In spite of the resources, still a sizeable number of rural population engaged in agriculture and related occupations cannot take advantage of the continuing education facilities offered by agricultural universities for several reasons, viz (i) the location of university centres vis-a-vis the widely dispersed villages (ii) the non-availability of convenient and affordable transportation (iii) illiteracy, or poor interactive skills or inability to use tools of learning at the centre (iv) emotional factors (v) dif­ference in one’s own self to learn or an attitude of resignation or blind acceptance of traditions (vi) woman, people from deprived sections and social outcasts of one form or another work under a terrible sense of inadequacy to operate in interfacial encounters found at university centres of continuing education.

Because continuing education of people engaged in agricultural occupations is a Sine Quo Non to increase their

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productivity, to improve the quality of their lives and to enhance their effectiveness as citizens, the agricultural universities should devise an alternative model of distance education that should by-pass the said constraints on one hand, and offer an irresistibly appealing package of learning to a client. The GTT model described hereafter is intended to provide such an alternative.

The philosophy at the root of GTT: In order to be effective a distance education programme meant for a target group that has kept away from the existing traditional distance education programmes, must be based on three philosophical foundations, namely,

1. The programme must be genuinely client-rooted at all levels and in all respects. It must be a participatory enterprise rather than a prescriptive reforms movement.
2. It must be problem-based and result-oriented leading to solution of problems in a convincing manner.
3. It should have a built-in mechanism for continuity.

The structure of GTT: Based on the tripod philosophy, GTT has a trilateral structure as represented in the figure below:

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          Transformation
          /        \
   Generation    Transaction
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It's a structure that rests on the interactive foundation of generation and transaction resulting inevitably in the transformation of a situation-human, physical, technological etc. A meaningful educational experience based on the GTT model must lead to a desired change in the educatee.

Generation: Generation in the model pertains to an on-going personal as well as interpersonal productive activity
in various areas of the macrocosm of education. By involvin
gthe clients-farmers, farm-workers, dairy persons, craftsmen
and others—in specific tasks along with resource persons-
university teachers, experts, researchers, counsellors and
other—in creative encounters like brain storming sessions or
laboratory experiments or farm demonstration, a highly
yielding process chain will be set in motion generating
numerous ideas, problems, suggestions, resource materials,
techniques etc. All these will be fed into the interactive mill,
will be processed by cooperative endeavour and will lead to
the development of curricula, course plans, action plans,
support materials and so on. To operationalise this part
of the GTT model, the university will have to establish
'think-tanks' at the grass-roots level—in villages, in
clusters of hamlets, in social organisations and provide them
expertise through training and self-guiding materials so that
they are maximally productive. It should also build up
channels of quick communication and feedback in order to
evolve progressively better, more realistic, more practical
schemes and programmes of education even for the most
reluctant learner from a remote area. Involvement in this
generating process triggers inner ethos in the learner to
participate, to act and to share.

Transaction: Transaction pertains to the process of
total implementation strategy of the programmes and materials
generated. This replaces the traditional approach of 'take-
it-or-leave-it', and brings in the approach of 'let's do-it'. The
client and the teacher are bound together in a bond of
partnership and mutuality. There is a lot of intermingling of
resources like the mass media, software of a large diversity,
self-learning models; methods of auto learning, visitation-
cum-counselling, intervention by social agencies like farmers'
forums, youth clubs, women's organisations etc.

The idea of curriculum transaction under GTT does not
advocate direct teaching. It rather conceives of a four-fold
scheme of effective cooperative delivery, close monitoring, formative evaluation and precise feedback. To operationalise this idea, the universities shall have to adopt a 'sellers' market' approach with an understanding mind and a sympathetic heart to make the clients as active participants in the whole process. That will require personal care and an attitude of sharing on the part of the university personnel.

Curriculum: Curriculum transacts treats the client not as an object of the process of education, but as a subject. This approach shall have to be reflected in the media programmes, in their software, and in all interpersonal encounters. As a result, the university will reach the client in his home in his place of work, in his own environment and on his terms. It's a distance education with the hearts and minds at the closest distance.

Transformation: Transformation pertains to the end-product. The beneficiary, namely the educatee, must undergo change as a result of his participation in the processes of generation and transaction. His attitudes, his skills, his perceptions, his life-style, etc. must change for the better. By motivating the client to think, to experiment, to weight, to compare and so on, this model does not merely intend to change the individual, but it also deliberately intends to pave the way for a much wider change—change in the family, change in the occupational group, change in the community. It's a sort of a global change in the environment; and it is deliberate, it is preplanned and professionally structured.

This is possible because the client does not remain a passive object or an unwilling observer of the traditional impersonal distance education programme, but is an active promoter of a process of self-renewal, self-realisation. To operationalise this idea, the university personnel will have to rehabilitate the recipient of its distance education programme.
in his rightful place, that of active participation. This may necessitate a basic change in the direction and approach of the present programmes. Above all, the present practice of dishing out of precooked programmes will have to give place to a cooperative threefold activity under constant formation and change. The university will have to 'reach out'.

The prospects: Is the GTT model of distance education translatable into action in the present context of our agricultural universities? It certainly is, subject to the fulfilment of three conditions, viz. (i) the infrastructure of extension education developed over the years should be reviewed, streamlined, diversified and strengthened in the light of the GTT model. This will require redefinition of its objectives and philosophical and technological reorientation of its personnel, (ii) it will require the evolution of a comprehensive grassroots-to-university mechanism for interactive transaction of programmes and (iii) it will need the institution of a strong research-cum-experimentation-cum-innovation component in the distance education system for a continuous evaluation and change.

The prospects are, indeed, challenging, but they are no less romantic and rewarding for GTT has its eye on 'distance' which has always held the human race spell-bound.
USE OF VIDEO CASSETTES FOR DISTANCE EDUCATION
BY THE AGRICULTURAL UNIVERSITIES IN INDIA

ANUPAMA SHAH*

Distance education

Holmber (1977) has defined distance education as any one of the various forms of study which are not under the continuous, immediate supervision of tutors, present with their students in lecture rooms and that it includes all those teaching methods in which teaching is conducted through print, mechanical and electronic devices. Educators on the look out of the alternative models which can supplement the formal education system to ensure the access of education to millions of people deprived of it.

The social-political, geographical and academic compulsions in India make distance education necessary on a large scale so that education can reach the masses of rural people deprived of education. To be relevant and effective, distance education in agriculture will have to be well designed and affordable. The most important requirement of distance education is effective communication since face-to-face contact with the teacher, the pillar of the formal education system is missing in distance education.

Distance education through print media is not a recent idea. Video instruction has all the advantages of televised instruction besides the additional advantage of being independent and free from predetermined transmission time. Video lessons can be viewed by the learners at any convenient time either in their homes or in study centers. Video instruction can help to provide greater individualized and independent

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Instruction to overcome the barriers of space and time, the dropout rate of the distance education in many areas is higher than the conventional on-campus teaching. Video cassettes help to bring novelty in the instruction can provide enormous range and type of visual resources for the descriptive materials in agriculture. The advantages of Video instruction are many: (i) immediate play back, (ii) simultaneous audio-visual synchronization, (iii) recording in low light conditions, (iv) reusability of cassettes (v) portability and easy storage and (vi) despatch of cassettes.

However participation as a co-investigator in an experiment on Video instruction to the rural adolescent girls and women for the family life centred education has prompted me to inspect the appropriateness of Video instruction for distance education. A few pointers can be offered for the extension departments of Home Science Colleges in agricultural Universities since nutrition, water purification and preservation and rural mother-daughter relationship were some of the topics of Video production of this experiment. Before reporting the observations of our experiment, some theoretical and research discussion will be beneficial. They seem to have potential for promoting audio-visual literary affecting motivation, attitude change, reinforcement, community participation and entertainment.

Video approach is based on the belief that communication is a necessary prerequisite for social change, that rural population in the process need to be transmitted valuable knowledge and that video is the tool fit for this aim. In our Video instruction experiment also, the rural female respondents showed significant knowledge gain but the change in opinions was not substantial. There are two experiments on Video instruction with rural population in India (i) Saharanpur experiment by CENDIT in the village of Uttar Pradesh demonstrated the possibility of video in humanising the
process of communication. (ii) SITE by ISRO (1977) Ahmedabad brought out the fact that gain in agricultural awareness was comparatively less as compared to animal husbandry. However, it was reported that it failed to generate in the rural acceptors the process of logical reasoning and thinking due to non imaginative programme planning and poor follow up support. The predetermined information based on the planners judgement and less feedback also were the contributing factors. More adoption of one or the other practice was interpreted as success of those efforts, which is certainly an insignificant aspect of the experiments. Azad (1987) reports that there was no significant difference between learning from conventional teaching and television teaching in USA. Lorraine (1977), Lewis (1977) and Banerji (1976) report educational Video experiments' success in achieving social consensus, in developing socio-political awareness among rural people, in opening up the channels of communication between different sections of a society, enrolling members of rural cooperatives, promoting family planning programmes and training rural field health personnel of all types in various countries other than India.

So the basic questions of democratisation of media, community initiative and sustenance of community action can be answered to some extent by the use of this modern media – Video cassettes. Distance education for rural communities through video instruction is however a challenging task and requires experimentation. The role of this new communication media in imparting agricultural education will have to be examined in the Indian situation and the constraints therein. As experienced in our experiment, the major ones are a lack of self-reliance in the hardware and software materialism expensive and elaborate studio settings, inadequate editing facilities, inadequate technical expertise, complexities of the clientele regarding language, economic status and educational background, their association of video with entertainment and
financial inability of educational institutions to meet the expenses of video production.

So two things are highly recommended:

- increased opportunities for the academic staff to get training in script writing and direction of production of video cassettes.
- encouragement to low cost production techniques involving the use of local materials and equipment.

Majority of the rural distant learners may not have an access to video cassette players now but in a decade or two, its accessibility number would be highly satisfactory.

Distance education is complementary to the conventional system, utilizing the later’s academic and physical facilities. It would cost more, if it were to exist by itself. Distance education if it caters to a large number of students, it is cost efficient. In video production, which is a high technology system, the investment of resources and the cost involved in the production and use of video cassettes can be justified only on grounds of cost efficiency that is, only if there are sufficient students to bring average cost down. The production of video cassettes in agriculture should be as far as possible on an all India basis or at least on a large region basis. So it is significant to check whether there is high demand for a course or if there is a high social need to reach deprived target population irrespective of cost.

We should be cautious in video production since, to continue distance education through video instruction with a fair degree of efficiency throughout the year, there should be enough cassettes, constant electricity supply and easy availability and repair facility and spare parts. Moreover, it has to be realised that no subject or theme can be adequately dealt with any medium. So multi-media approach which may include video cassettes will have to be used. It is hoped that
agricultural institutions for higher education can soon overcome the problems related to video production and use and be able to make use of its good audience appeal since video libraries of media centres of our country also, at present do not possess cassettes on all relevant topics.

Till then, India being a developing country, the use of video instruction for distance education in agriculture, or for that matter in any subject, will have to be a restricted one.

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TRANSFER OF AGRICULTURE TECHNOLOGY THROUGH DISTANCE EDUCATION

G. S. SAINI*

Recent advances in technology have brought many changes in the life style of the people. It is apparent that existing educational infrastructures related to agriculture are physically and financially inadequate to meet the growing needs of farmers, farm women and rural youth. There are a large number of rural people who did not have enough resources and could not leave their homes/work places to join institutional training programmes. Thus, distance education has enough scope to improve the behaviour components related to gain in knowledge and skills and creating favourable attitude towards modern agricultural technology. It will serve the following objectives:

i) To impart basic knowledge to rural youth, farmers and farm-women related to all subjects of agriculture and home science, respectively,

ii) To motivate and prepare rural youth for self-employment avenues in the field of agriculture, and

iii) To offer graduate/postgraduate level degree courses to rural youth.

Curriculum development

Different courses have to be designed to meet the specific educational and training needs of rural people. Course will also differ as per the objective cited earlier. Keeping in view the available expertise and professional competences in agricultural Universities in India, it is feasible to start/strengthen the distance education under the discipline of Extension Education in Agricultural Universities.

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The Punjab Agricultural University, Ludhiana, initiated first correspondence course in 'Integrated course in Agriculture' for farmers during the year 1971. Subsequently, four other courses on 'Home Management and Family Life for Farm Ladies', 'Farm Power & Machinery Maintenance and Operations for Farmers', special Integrated course in agriculture for small and marginal farmers and special Home Management and Family Life courses for small and marginal Farm Ladies were also started. So far 5724 general farmers, 1449 small farmers, 2403 farm women were trained through correspondence courses in Punjab. The courses meant for farmers were devoted to Soil Science, Agronomy, Horticulture, Vegetables, Botany and Plant Pathology, Entomology, subsidiary occupations, Animal Husbandry, Poultry, Farm Machinery and Farm Management. Similarly, Farm women courses included contents on Foods and Nutrition, Family life, Child Development, Clothing and Textiles, Health and Hygiene, Kitchen Gardening, Fruit and Vegetable Preservation, Home Management, use of Home Insecticides and Pesticides, Dairying, Poultry and compost from Household.

The lessons on the contents referred earlier were prepared by a team of Subject Matter Specialists on the basis of the training needs of the farmers and farm women. It is ensured that the contents are technically accurate, specific and precise. The sentence are simple and short. The sequence of lessons is based on the timely application of the contents in homes and farms and level of understanding of the trainees. Based on the findings of researchers and experiences, additions and modifications are made in the contents of lessons from time to time.

Regional Research Centres / Agricultural and Home Science Colleges

The Agricultural Universities have opened regional research centres/Agricultural and Home Science Colleges in
the States. Some Universities have appointed a team of experts at the District Headquarters to provide advisory service to the rural community. This facility could be utilised for conducting the personal contact programme and to strengthen the interactions between the distance educators and students.

Media use

Print media a commonly used in Distance Education. Studies have shown that 'Multi-media Approach' depending upon the purposes of the media, suitability to the contents of study and proper combinations with other media is more effective in bringing desirable changes in the behaviour of an individual. Practical knowledge and skills are better communicated through the use of televisions, films, slides, etc. These media are not the substitute of one and other rather these supplement and enhance the effects of learning. The use of 'Visual' effect in Agriculture Education is indispensable. All this can be done by creating a close association between the distance educators and media organisations in the State.

Research components

For providing feed-back to the distance educators and the effective implementation of its programme, it is desirable to conduct systematic and periodic research and evaluation. Four Postgraduate students of Punjab Agricultural University, Ludhiana, completed their studies in the field of correspondence education being run by the Department of Extension Education in the same University. Some of the salient findings (Kaur, 1982 and Saini 1982) are presented here under.

i) The distance teaching was efficient in the fulfillment of Information Needs of the Farmers in respect of Agricultural Technology.

ii) The content of lessons were comprehended by the farmers (81.25 per cent) and Farm-women (77%).
iii) The farmers and Farm women (75%) made use of information to a great extent at their farms and homes.

iv) The farmers increased the average year under improved practices of cultivation of selected crops after the completion of the Distance Education Programmes.

v) The farmers and farm-women enrolled under the courses were mostly young (20-30 years) and school drop-outs and had small farm size (upto 5 acres).

Requirements for starting Distance Education Programme

Adequate staff and budgetary provisions are required for the:

i) Production of instructional materials.

ii) Use of multi-media like radio, television audio-visual cassettes, audio-cassettes etc.

iii) Creation/strengthening of infrastructure at district level for providing efficient and effective face-to-face instructions between the trainees and trainers.

iv) Expenses towards travelling by staff.

v) Organisation of refresher training courses to update the knowledge of the distance education staff in designing, planning and monitoring of distance education programmes.

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A STRATEGY OF DISTANCE EDUCATION IN DAIRY DEVELOPMENT

M. N. SINHA AND S. V. N. RAO

During the last decade dairy development scenario has tremendously changed promising high dividends. Sixty million dairy farmer households are producing around 42 million tonnes of milk (1985). There are over 20,000 milk producer co-operative societies, 233 liquid milk plants and 46 milk product factories. The infrastructure facilities include 600 key village blocks, 130 ICOPs, 140 cattle breeding farms, 44 exotic farms and 56 frozen semen banks.

Thanks to the distinguished success of NDB and State Milk Federations, sustaining support of Animal Husbandry Departments, NABARD, and Voluntary organisations and manpower output of NDRI, IVRI, IGERI, Agricultural Universities (with 7 Agri. Colleges, 22 Veterinary Colleges, 8 Dairy Science Colleges) the dairy has made its singular impact in general on national development transformation. However, there is a huge gap between what could be possible and what is the present productivity level. Organised farms (both private/public) are producing 8 to 10 litres of milk per cow per day whereas, farmers on the average are hardly getting a litre of milk per cow. Genesis is gap can be viewed from different angles. Swaminathan (1976) observed that "The technology is now becoming available but the mechanism for transferring it to the illiterate and small owners in an effective manner does not exist. Ironically there is a global communication network which makes the latest findings of science available almost immediately to research workers in any corner of the world but what is urgently needed is such a communi-
cation network at the service of the poor farmer in our country". ICAR is its recent study has highlighted that over 70 per cent of agricultural research in the country since independence is confined to the laboratories and experimental farms.

Reasons identified for these wide gaps are poor knowledge and inadequate skill on the part of farmers and inadequate supply of production and service inputs. These reasons revolve around education of the farmers. Leaegans (1980) perceived that education is the production of changes in human behaviour. According to Sudarsanan (1981) education is an enduring process by which an individual changes his/her behaviour through participation and interaction in desirable ways in the area of knowledge, skills, attitudes and values related to enhancing the quality of personal, social and national life, their growth and development. With reference to dairying, education aims at inducing positive behavioural changes in the knowledge, skill and attitude so as to enable them to adopt the relevant technologies for improving their socio-economic conditions.

The probable educational avenues for the benefit of different clientele involved in dairy development are diversified in nature. Agriculture, Veterinary and Dairy Science Colleges are imparting higher level training. Besides, KVKs/KGKS/Farmers Training Centres, spread over different parts of the country are also imparting vocational training.

Distance Education: Its concept/relevance

Sudarsanan (1981) conceived distance education as learning-teaching organised under the non-formal system using multi-media instructional designs and a few face-to-face contact programmes for learners. It enables a few teachers to cover a large number of learners spread over fairly large area with an inborn disadvantage of inadequate inter-personal
contact between the teacher and the learner. In agriculture and allied fields it is still a new concept because the clientele are mostly illiterate.

The task of educating the dairy farmers is quite gigantic as the nature of clientele and the subject matter are quite varied. The target groups can be of three categories:

i) Educated Dairy Farmers
ii) Dairy Entrepreneurs
iii) Extension Personnel

The common thread is all the three groups is literacy and involvement in dairy development. The superiority of distance education over other methods lies in:

i) creating an awareness knowledge among the learners

ii) enabling the learner to seek further information irrespective of the physical distance between him and the teacher and

iii) reducing the cost and time per learner involved in education.

Essential elements of distance education

Sound learning situation comprises of i) Effective leader, ii) Interested learner, iii) Useful subject matter, iv) Appropriate instructional materials and v) Good physical environment.

The trainers in a programme like this must be proficient in the subject-matter and must have creativity in designing and arranging the teaching material in an interesting manner to the learners. His skill lies in understanding his clientele...
and developing the course material well suited for them. In addition, the trainer must be in a position to understand and analyse the clientele problems. As the trainer is going to rarely interact face-to-face with the learners, he must exercise his ingenuity in developing a suitable programme which could be understood easily without the direct guidance of the trainer.

The learners of the programme are those who have interest in acquiring the knowledge related to dairying. However, they must be literate to the extent of reading and comprehending material in local language. As such this programme could benefit literate dairy farmers, dairy entrepreneurs and extension personnel. Subject matter content obviously would be dairy production technologies to be adopted by the farmers and processing technologies which are of use to the entrepreneurs. It must include pictures related to the subject, success stories, cartoons, sketches etc. which are essential to win the attention of the learners.

The content is to be presented to the learners in attractive and interesting fashion. It contains written information in local language supported with figures, cartoons, photographs etc. In addition to this, few face-to-face interacting sessions could be arranged to enable the interested clientele to acquire the skill and additional information. Hence, the DEU (Distance Education Units) must essentially be equipped with facilities of A. V. Aids and the necessary infrastructure amenities for demonstrating as well as enabling the learners to practice various skills.

The new technology of developing video cassettes for effective learning could be very well made use of wherever the facilities are available. It has got the added advantage of involving both the senses i.e. seeing and hearing of the learners and hence better understanding of the content.
Organisations

To organise a programme of distance education, the following steps could be adopted.

1. An institution or a separate department must be created with necessary infrastructure facilities such as a) Trainers or experts in the field of dairy science with sufficient exposure to either field (Farms) or dairy plants b) A.V. Aids c) Printing press or facility to print the matter dairy farm d) Office paraphernalia. The organisation should have units located preferably in a District Headquarter so that it can better serve the dairy farmers.

2. As this programme is for only literate dairy farmers, dairy entrepreneurs and extension personnel, and because it is not possible to educate all the target group learners, in the first instance it is better to identify few interested clientele in all the three categories. This could be easily done through.

   i) Mailing the registration forms to the Vety. Surgeons/Compounders/Stockmen to enroll the interested people.

   ii) Publicity through the extension officers/VDOs and

   iii) Radio broadcast / Newspaper advertisements.

3) Analyse the need perceptions of learners in dairying.

   This analysis helps in finding out the specific areas in which the clientele want or wish to improve their knowledge/skill. Based on this information the clientele could be very well classified or regrouped and the relevant information could be fed to them. This essential because of following reasons.
i) the learners would be interested to know more about an aspect or item which they perceived as important or essential.

ii) save time and money

iii) helps in delineating various problems which require immediate attention of the scientists.

iv) aids in organizing suitable short duration training programmes for teaching the skills to the needy and interested clientele.

v) at any part of time all the clientele do not need all the information related to dairying.

4) When once the clientele are regrouped as per their areas of interest the subject matter or information could be prepared to suit to their needs and the same could be despatched to the clientele. Here, in fact lies the skill and ingenuity of the trainers or professionals in developing and presenting the required information in an attractive, attention catching and interesting manner to the clientele. The information must be sent to them at appropriate and scheduled pre-fixed timings so as to enable the clientele to assimilate the information supplied to them in phases. The trainers must see that a live communication channel exists between most of the clientele and the organisation. This could be facilitated through:

i) Promptly mailing the messages

ii) Promptly replying to the queries.

5) Dairy farmers cannot acquire the skills just by reading of literature alone but acquire knowledge - 'What' and 'Why' of the information? Therefore, short duration training programmes to satisfy 'Learning by doing' could be organized in the specific areas designed exclusively for those who wish to acquire further information or skills. These training programmes facilitate face to face interaction between the
trainees and the trainers which help clarify many doubts and also aid the trainers in better appreciating the problems of the clientele.

6. The programme needs to be monitored effectively to see that it runs as per the designed objectives. It is always better to evaluate it periodically to determine the extent to which the objectives have been achieved. Based on the results of evaluation necessary changes could be introduced in the programme so as to make the programme effective as well as efficient in educating the clientele.

Implication

Distance Education in Dairy Development has good prospects. This may be taken in phased manner as enumerated above in the spirit of dedication, so as to cater to the educational needs of the three groups of literate clientele in dairying.

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DISTANCE EDUCATION

Dr. (Mrs.) L. PHADNIS*

In India, large percentage of rural population is illiterate or had no chance of going to school or college, due to various reasons. Like all other fields of education, even agriculture has grown and changed quite a bit from what it was a fifty years ago than what it is now.

Agriculture became a part and parcel of higher education with the advent of Agricultural Universities in India. The knowledge generated in these Agricultural Universities has to be transferred to rural population who are the tillers of the land. Thus, extension has become a part of Agricultural Universities by which university is able to pass on the information on a limited scale to farmers.

Correspondence education and distance education are in a way extension education at different levels. Both these, at higher levels of education which cater to the needs of large groups of individuals who are spread out and are unable to take advantages from already existing institutions. Distance education, gives an opportunity for higher education to many, who for one reason or the other could not or have not had the access to it. In India, as in other developing countries, economic disadvantage coupled with vocational preoccupation have deprived a large segment of rural population of higher education.

Correspondence education is in vogue in our country since some time and the distance education is of recent origin.

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Distance education is an open education which breaks away from the traditional constraints on education as a process - not an absolute but a relative term.

Distance education has multimedia approach. It not only uses print, but also audio and video. This makes the education personalised and gives an opportunity for the learner to get the knowledge from the best teacher/research worker directly. Thus a contact between learner and taught gets established.

Pedagogic functions of distance education may be to:

1. Provide motivation which may be structural or functional. (Examples of structural motivation are format, attractive cover, colour etc. The functional motivation are the materials based on needs, written personal styles, enjoyable exercise etc.)

2. Provide links with learners experiences by giving a gentle start with revisions, following, using individualized language, giving hints on study skills, building the materials with everyday matters and experiences.

3. Provide feedback by the use of self-test questions/exercises with answers and explanatory solutions, summaries, schematic diagrams, assignments and so on.

4. Provide activities such as exercises, assignments, references etc.

5. Facilitate reduction by giving explanations, illustrations, arranging for revisions as well as applications.

6. Promote transfer by providing varied types of applications exercises in different fields.
7. Give guidance by following self-explanatory type of format, giving emphasis, using italics, margin headings, titles and sub-titles definitions etc.

8. Identify objectives and aims and finally and

9. Present the material.

Generally a course in distance education is the programme which is divided into blocks and further into units. Unit is the material presented to the learner at one time. Presentation of material should have intellectual clarity, linguistic simplicity, concretized by illustrations, diagrams, lexivision and use of variable media.

Printed course material constitutes the main stage of teaching through the distance education system. Although revolutionary changes have been brought about by mass communication media development in educational methods, printed course material is still the most important means of imparting instruction to thousands of learners at a distance. But it is essential to ensure academic standards, integration of both teaching and learning processes, a simple and personal style and lucid, logical and coherent presentation.

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DISTANCE EDUCATION FOR RURAL DEVELOPMENT

N. JOSE CHANDER*

Distance Education is the process of teaching students at a distance with the aid of multiple media like the print or correspondence texts, radio, TV, audio-video cassettes, and the like. Distance Education has special relevance in a country with large population, widely dispersed and having limited financial resources for educational development. Eighty percent of India's population live in rural areas, carrying on largely agriculture or related occupations. This means that the major portion of our human resources is rural and agricultural. Distance teaching is an effective technique for conveying basic knowledge and new information to these people who form the backbone of Indian economy.

The need for training or developing manpower engaged in agriculture needs to be underlined. Not only are the people engaged in supervisory white collar positions that require frequent orientation, but the actual tillers of the soil or the farmers should be given the basic scientific knowledge about agriculture. Knowledge about the nature of the soil, the need of soil conservation, the character of diseases affecting plants, methods of preventing diseases etc. will definitely help the farmers to increase production and productivity. The wealth of knowledge accumulated in our research institutions and universities should be carried to the actual cultivators. Farmers and farming supervisors can be continuously equipped, updated and enriched through programmes of community education and continuing education organised under the leadership of agricultural universities. Distance teaching is

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<td>7. Economics of cultivation and Family life</td>
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<td>12. Professional Agriculture</td>
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<td>13. Hindi and write</td>
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**Eligibility**
- can read and write HIndi
-有能力写印地语
perhaps the most effective means of reaching the people under these programmes. There are five agricultural universities, as far as I know, already engaged in programmes of distance education meant for the farming class. (Chart-I)

The chart indicates the wide scope for similar action by other agricultural universities in India. There are perhaps other areas to be covered for enlightening the farmers. Further, it is not clear how many farmers have been reached by these programmes and how many have benefitted from them. Apart from these mass programmes there can be programmes of continuing education for those who have already taken courses on agricultural sciences and are engaged in supervisory work or research. Those who are devoted to their profession are genuinely interested in acquiring information about the latest developments in the field.

In this connection I would like to identify the major problems of management that department of distance education will have to tackle: course development, choice of media and instructional strategy, recruitment of staff for preparation of course materials, two-way communication and finance.

**Course Development:** A course in this context implies the collection of study materials such as printed texts, audio-video cassettes and other materials with which the student is expected to interact for the purpose of attaining the intellectual or skill level set as the objective. Course development is the process of making the materials ready for delivery, starting from course designing and ending with production. A course design shall be formulated in accordance with the objectives of the course and the character of the target group for whom the course is meant. Outline and contents ought to be different when courses are designed for a group of literate farmers and for a group of B.Sc's in Agriculture. The objectives of the course - what the target groups are supposed to
attain on completing the course - shall be clear, specific and pragmatic.

Media Selection: For the effective instruction of a course meant for the farmers, print shall be the only medium to be used. Print medium cannot be very effective with people of a low level of education. Radio, TV, Audio-video cassettes shall also be made use of. But their use depends on their availability and accessibility among the common folk. TV and video cassettes are the most effective in teaching certain types of subjects whereas radio or audio tapes may be useful in certain others. Selection of media is crucial in determining the strategy of instruction.

Personnel for course production: Personnel with various types of training and skill are required for the purpose. Course writers, editors, graphic designers and media men should collaborate in course production. Writers, particularly, should be exposed to the style and presentation acceptable to the target group. Mere formalists drawn from the faculty will not have the interest or the commitment to adjust themselves to teaching a group of farmers. It is a matter of policy to decide whether a particular institution should have a full time permanent staff, or only a part-time staff or have them combined. However, it is important to identify the right persons to write the course materials.

Two-way communication: One important characteristic of distance education, whatever the academic standard of the course, is the absence of personal contact between the instructor and the student. This is often made up by occasional contact programmes of personal contact such as summer schools or tutorials and impersonal contact through assignments and their evaluation. Their nature and frequency are to be decided in accordance with the nature of the course contents and the target groups. However two-way communication is essential for distance education.
Finance: Finance is perhaps the most baffling aspect of management in this country. It is a matter of policy whether the institution should be run on deficit or it should make a surplus. Fixation of the rates of fees to be charged on the students and the scales of service to be rendered depends on this policy. All the activities involved are expensive, particularly media production. If production can be done on an industrial scale the variable costs can be brought down. It is said that electronic media are going to be cheaper in future than the print medium.

All distance education institutions that operate well and serve satisfactorily are those with no fund problems. They either get large subsidies from government or are able to raise revenue through large enrolment.
Mahatma Gandhi said "If god were to appear in India, he will have to take the form of a loaf of bread." India, as we know, is basically an agricultural country and nearly 70 per cent of the total population live in villages. In spite of that, production of food in India has not been able to keep pace with the growing population. As a result, a minimum balanced diet for all Indians is still a dream. Self-sufficiency in food thus becomes not merely a desirable goal but a condition for survival.

Large scale capital investment for the provision of irrigation, fertilizer, pesticides, improved seeds, credit facilities for farmers, satisfactory arrangements for storage and distribution of farm products, improved communications and transport, electrification etc. are only a means to achieve this goal. In addition, we have to pay considerable attention to high quality education and research for agriculture. 

Role of agricultural universities

Agricultural Universities can play a leading role based on three major elements -

a) Research or the development of the appropriate technology.
b) Extension or the communication of the technology to practising farmers, and
c) Training of the needed personnel.

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Research and extension generally come under the Central and State Department of Agriculture and the community development Administration while training has been traditionally the responsibility of Universities. But the problem we face is improper co-ordination between these two departments. Such isolation has seriously affected the quality of training given and the research carried out, both of which have been insufficiently related to farm practice. Thus the most distinctive features of the agricultural Universities are their integrated programme of research, training and extension.

How to meet the challenge?

The success of agricultural education depends on three main changes:

a) To upgrade the skills of extension workers by induction and inservice training.

There are four factors of any production, i.e., land, labour, capital and organization. The most important of them is labour. Hence upgrading the skills of labour is very important. Likewise in agriculture the need to upgrade the skills of extension worker is recognized now. The village level worker (VLW) or 'gramsevak' is a very important part of the machinery of agricultural development.

I feel that unless and until we train thousands of educated agricultural scientists, engineers, technicians and extension workers, we cannot have large complexes of agro-industries. And the development of new technology as a whole, which the country needs must will not be fulfilled.

b) Separation of extension work from the supply services of Agricultural Departments: Officers concerned get very little time for extension work.

c) Farmers can only get confidence when extension workers work with them in the fields.
Some problems of agricultural education

a) Transmitting technical knowledge to the farmers so that they can use it in their fields and increase their income.

b) There are some 70 million farm families in India and at least 85% of them are functionally non-literate (illiterate)

c) Progressive farmers who probably own more than half the agricultural land are receiving attention; and

d) Lack of proper audio-visual methods to communicate the message.

"Distance education" what it is?

The face-to-face system of education in India is undoubtedly a matter of disgrace today. Personal encounter between teacher and taught is the essence of education but only a few students have ever experienced this essence.

Conventional University Learning is basically based on a study of textbooks and other printed materials supplemented by and linked to tutorials, lectures and practical work wherever this is appropriate. Thus the normal university student may attend one, two or three lectures per day. There the teacher imparts instruction and shows how it can be used. The student also attends tutorial, seminars and in some cases laboratory sessions where he practices the presentation and use of materials. Last, he will have to read widely and deeply textbooks and journals relevant to the subject of his study.

Distance Education (DE) has a somewhat different approach as it makes rather different demands upon the student. Teaching method in DE is designed to guide to students through their studies week by week. Most of the study materials is sent to them by post regularly. The materials include a series of specially written
texts, notes on radio and television broadcasts, reprints of articles and other documents, and assignments for the students to complete. These answer scripts are generally corrected and commented upon by the tutor-counsellor and then sent back to the students. Moreover, normally the students are able to seek guidance from the counsellor on various issues including their personal problems.

Advantages of Distance Education

1. It helps in equalizing opportunities for education for the neglected sections of society.
2. It is a boon to in-service people.
3. It is a less costly method of providing education if adopted on a large scale.
4. It helps national integration.
5. It expresses faith in the dignity of the individual and his capacity to improve upon himself.
6. It is free from the rigidity of age, time and space. The learner learns at his own pace and time. He is a 'non-captive'.
7. As DE is based on audio-visual media in addition to the correspondence medium for communication, it enjoys a upper hand over face-to-face teaching; and
8. The system of teaching by correspondence material, television and radio will be open to the public for criticism and suggestions for improvement.

Some areas for improvement of agricultural education through Distance Education

a) One year advanced course to selected village level workers.

b) Refresher training course.
c) Special training course.

d) Refresher course for extension officers to improve professional competence.

e) Separation of supply service from extension service.

f) Establishment of Primary Extension Centre and

g) Liaison with successful farmers.

Some problems of imparting agricultural education through Distance Education System

A) Handicaps

i) A majority of the farmers in India are poor or economically not well-to-do. Very few freeships and little financial inducements are available for the students.

ii) Agricultural education is not a separate section of education but it is an integral part of the whole education system. Backward area do not provide even the minimum educational facilities. Thousands of villages have no schools/colleges. In certain areas institutions are situated at 10 to 15 km of distance from villages.

iii) Financial handicaps tied up with the death of a parent/guardian students coming up from large families, unemployment etc. come in the way of motivation.

iv) A significant group, particularly women become handicapped and cannot get education because of parental resistance.

B) Motivation: One of the most important problems of DE is 'motivation'. Personal attitude, cultural background, social status and economic factors influence motivation. Due to less publicity there is scant awareness about DE programmes specially in rural areas of the country.

C) Learning needs: No doubt the learning needs of a DE student is tied up with his educational, occupational and family backgrounds, home environment, study conditions,
leisure, availability of books, access to a library and the comprehension level. But his basic requirements are:

i) Good instructional material
ii) Radio report
iii) Personnel contact programmes
iv) Study centres-cum-libraries
v) Counselling service
vi) Assignments and response sheets.

D) Courses or programmes: In most cases in India students of DE at present pursue courses of study which are not specifically designed for them. They study the same courses which the regular students do. Thus most of the DE courses remain a mere extension of the system of University education. This has in a way narrowed down the scope of DE. DE should specially be linked to job requirements. They should be flexible enough to meet both the needs of the students and those of the changing society. Hence, we see that DE can not only play a massive role to impart Agricultural Education and training to inservice people, but it also has the potentiality of transmitting knowledge to the masses.

Comment: I firmly believe that some sort of orientation on agriculture will make everybody aware of the problems of the farmers. Giving due respect to its economic importance I, therefore understand that a little knowledge of agriculture should be an integral part of all general education. Every citizen must be made aware of the problems of agricultural and rural life irrespective of his status and occupation. Such a general agricultural orientation will thus lead our future generations to agricultural careers and it will be a tremendous feedback for the future policy-makers. This will also lead to the economic stability of our nation. The only solution to the problem, however, lies in setting up a massive literacy campaign through DE by the Agricultural Universities.

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HISTORICAL DEVELOPMENT OF DISTANCE EDUCATION

S. L. MAKKAR*

Distance Education owe a lot to the Open University of the United Kingdom (O.U.U.K). It is not that the organisa­
tional or education models are necessarily appropriate to
the rest of the world nor that its courses are what the rest of
the world is demanding, nor even that its teaching methods
are adaptable to other nations. What the OUUK did was to
legitimise teaching at a distance. The university proved that
it could be as efficiently and effectively as at conventional on
campus teaching institutions at a cheaper rate and that the
end product was acceptable in the market place.

But the development of the distance mode of teaching
proceeded slowly. Teaching consisted largely of printed
notes supplemented by face-to-face classes either at the
remote study centres or at on campus residential schools. In
the early post war years there was some growth but it was
not until the 1960s that a rapid growth began.

The need of Distance Education

The answer is that Distance Education showed that it
could provide educational opportunities to a large number of
people who had been previously denied of such opportunities
and it could be done in a cost effective manner. It has
provided access to learning and at the same time can provide
access to many more.

The developing countries have found that distance
education can answer to the almost insurmountable problems
of how to take education of the large number of their popula-
tion who are isolated geographically. Even the developed

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countries have found distance education to be the way to take education to their urban isolated people in cities who are for one reason or the other cannot attend classes. Thus, both developed and under developed nations have found useful distance education to take education to the socially isolated.

The underlying reasons for the Distance Education are as follows:

1. Geographical Isolation: People may be geographically isolated because of distance because of terrain and due to communication that it has not been developed for example Australia which is 400 Km from North to South and the same distance from East to West which has a population 15 million people. There are groups of people in isolated rural areas also who are solely dependent on distance education from their first year of schooling.

The main Island of Papua New Guinea has a high mountain-chain running through the centre with equally high bridges running at right angles to the sea. The country, thus consists of a number of nodes with the Sea on one side and high mountain on the other three sides. People living on each of these nodes have developed isolation through the actual distance between them is small. But distance education techniques mean that education can be brought to these groups.

2. Social Isolation: People can become socially isolated for any number of reasons. Mostly because they are disadvantaged in some way of economic, physical, emotional or family circumstances.

3. Disadvantaged group: Taking education to disadvantaged groups is no easy task. Generally speaking people in such groups lack confidence in their own ability to learn of course, most of them have the ability but they have not come
to realization themselves or even persuaded to test their abilities. They are reductant to participate in face-to-face classes where they feel that their shortcomings will be exposed.

However, distance education techniques enable people to undertake a course of study in privacy. Thus, they can learn at their own pace and take refuge in the fact that they can succeed or fail without the fact being public. Many of these people when they have achieved success and when they have gained confidence may shift to face and face mode. But their introduction is gained through Distance Education.

4. Institutional Growth: If one considers the large number of institutions in the region or around the world are expending resources on distance education programmes, then one must presume that this a viable process e.g. the recent directory of resource materials used in distance teaching by higher education institutions in the Australia Pacific region that was compiled by the UNESCO Regional Office for education in Asia and the Pacific (1984) highlighted the fact that 34 institutions of higher education in Australia, Newzealand, Pakistan, Sri Lanka and Thailand were heavily involved in distanced education. Distance education courses in the region are currently available on subjects drawn practically from all disciplines as diverse as Biological, Aquatic Resource Management, Digital Electronics, Civil, Electrical and Mechanical Engineering, Surveying, Computing, Prehistoric Archeology, Economic education, Psychology, Sociology and a wide variety of language subjects. Evidence for such a massive investment in Distance Education in such a wide range of context suggests that it can work.

5. Discipline Areas: Equally ironic is the fact that it is often the distance educators themselves who submit that only a limited number of discipline areas can be taught at a distance. The classic argument is that medicine cannot be
taught externally. Thus, distance education techniques can be used to teach a wide variety of courses across a wide range of disciplines to most students. The basic necessities are that the students be motivated to learn and the instructional materials be well designed. Most instructional techniques are available to distance teachers are multi-functional, may be adopted to objectives learners and course discipline areas.

But the instructional-packages must be functional but what matters most is the efficacy of the instructional treatment contained in the instructional message.

Radio is the only teaching method/medium available because of poor ground communications thus, it can be developed as the most effective teaching medium. The pre-requisites are that the teaching sessions be well structured secondly based from an instructional perspective and the students be well motivated. Of course, the problem is that not all the students are highly motivated. It will be better if a wider range of distance teaching techniques are used provided they are available.

6. Not for adults only: If sometimes be taken for granted that distance education is synonymous with adult education. The concept initiated by the (OUUK) that distance teaching for the adults who have missed the chance of attending a conventional university in their youth. Thus the word open university appears in many minds to be synonymous with unqualified adults. Distance teaching techniques can be used to teach people of all ages, to teach courses from a wider range of discipline areas both vocational and non-vocational.

It is pity that senior Distance Educators who have spent many years argue that distance teaching produces end product at least not equal to that produced by conventional institutions.
that the distance teaching is only suitable for adults that
some-thing happens at mag 21 to 23 years which makes the
students susceptible to distance teaching techniques. How­
ever, there is no evidence to prove this assertion. Indeed,
there is much evidence to refute it. In Australia, the students
in remote areas have successfully been taught at a distance
from the beginning of their primary schooling.

**How cost effective is Distance Education**

A Distance Teaching Institution which prepares well
structured instructional-packages using a variety of techniques
which provides good teaching and administrative support to
the student can obviously operate at lower cost per student
than a conventional institution. One of the long standing
Distance Teaching institutions in London with good academic
standing which merely distributes course outlines, recom­
manded texts and sets examinations.

It has been demonstrated repeatedly that highly motivated
students can learn through any medium and had appeared
that students who succeed at London institution are indeed
highly motivated.

**Effectiveness:** If print, audio video, computer managed
learning and residential schools are all part of the teaching
 programme, the drop out rate may also be lower than if a
 single medium such as radio is used. There is evidence that
a hard core of students will persists and achieve success no
matter how the limited techniques are? Certainly Distance
Education System operates effectively at lower cost than
conventional institutions attaining the same academic
standards which maintains close to the same pass rates.
Distance Teaching becomes still most cost effective when
large number of students are involved.

Once a set of printed instructional material is prepared
multiple copies can be reproduced and distributed to any
number of students. The larger the number, the smaller the preparation cost per student. The production cost such as printing will fall of economics of scale. The distance education mode of teaching has enormous advantages for developing countries. It can be highly cost effective way of teaching.

The Distance Education perspective

Distance Teaching entails at least three elements which are not shared with much of conventional approach to teaching.

i) Distance teaching embodies a permanent record of instruction which is usually captured in print on audio tape or some other form of electronic media.

ii) Distance tends to embody itself instructional principles and is largely learner-oriented rather than teacher-centred.

iii) Distance teaching tends to engender the use of a wider range of media than is normally the case for conventional teaching. The fact that distance teaching is permanent based on self-instructional and generally entails the use of range of media has certain implications for the role of the distance teacher.

Instructional package advantages

The delivery of such instruction is not tried to a particular time and place as in the case of conventional education. Students can make use of printed study guides, audio cassettes and video cassettes when ever and is convenient to them. Such learning resources are fully adaptable to the pace at which individual student learns. The pace of learning is not determined by specific lecture or tutorial periods in group setting. Such materials provide the flexibility of self-pacing and also
create self-confidence among students who can take responsibility for their own learning. It is, however, essential that the instructional-packages provide self-instructional principles which are largely manifested in the provision of self-assessment questions whereby students are given question/exercises to complete and subsequently are provided with solutions and detailed answers. Which allow them to judge the adequacy of their own efforts. The well-structured distance education package make a productive use of learning time.

Distance Education for Farmers and Farm Ladies at the Punjab Agricultural University

The farmers and farm women of Punjab have shown keen interest for learning modern farm technology through distance teaching. This is a pioneer institution in distance teaching of its own kind. The programme was initiated through distance teaching in 1971. The following courses were offered for the young who intend to adopt agriculture as their life-long profession to update their knowledge of scientific farming and improved agricultural technology.

1. Integrated course in Agriculture for Farmers.
2. Home and family life for Farm Ladies.

Lessons are sent to the trainees in local language (Punjabi) every month. The question paper is attached with each lesson, for a particular subject. The trainees go through the question paper and are sent back after giving the answers. They are evaluated by the respective teacher of their field of specialization. Even the Himachal Pradesh and Punjab University of Punjab has started distance teaching for the last number of years in Arts subjects even they have included the elementary courses in Science subjects too. At the Punjab Agricultural
University, Ludhiana, India, the study was undertaken by Saini (1979) entitled, "Utility and Potentials of Distance Teaching". He concluded that the correspondence lessons were able to meet the technological needs of the farming community.

The role of Agricultural Universities to provide opportunities to make learning a life-long activity

In facing the realities of the present and preparing for the uncertainties of the future, the agricultural universities can play a significant role in individual, group and social learning. It seems that the Agricultural Universities can do many things.

1. It is generally accepted that one of the roles of the universities is to train competent scientists, Technologists, Administrators to extend and adopt technologies best suited to the development of the country.

2. The concept of life-long education must be consciously built in our learning programmes so that learning component in the development of individuals and society for making learning more efficient more accessible to common man may be achieved.

3. The agricultural universities are uniquely suited for the task making learning a life long activity.

4. The universities in general and the agricultural universities in particular accept new functions and responsibilities to educate those who could not afford to attend the formal education, programmes at the learning centres of education such as schools, colleges and the universities.

5. Agricultural universities can easily undertake the non-formal education through distance teaching by developing
instructional programmes of different types and of different levels considering the local needs, problems and resources.

6. The agricultural universities can play this assigned role to produce literature on the subjects to be taught for those who could not continue their studies due to one reason or the other.

7. The other role that agricultural universities can be expected to play by interlinking the university education with industries through workers, training programmes in vocation, and

8. Extension Services to farmers, teachers and other professional for better performance in their respective fields through distance teaching and learning.

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SELF-EMPLOYMENT FOR AGRICULTURAL GRADUATES - A PERSPECTIVE

A. KANDASWAMY AND N. SRINIVASAN

The Setting

Modernisation of Indian Agriculture through technological innovations has resulted in perceptible increase in agricultural productivity and hence production. A review of the progress made in the scene of agriculture exhibits the vivid facts of uptrends. The food grain production has been increased three times between the periods of 1950-51 (50.82 million tonnes) and 1983-84 (151.54 million tonnes). Similar uptrends could be witnessed in sugarcane (210 per cent increase), cotton (116 per cent) and groundnut (109 per cent) during the same reference period. By 2000 A.D, the food production is expected to be around 250 million tonnes and this would be a most challenging task. To step up agricultural production, the land, labour and capital are to be organised effectively by applying the modern technology in farming. The fast growth of manufacturing and servicing sectors in the economy creates demand for variety of agricultural products. These provide many opportunities for the young agricultural graduates to take up farming and farm-based enterprises as a business ventures.

Avenues of Self-Employment

Livestock: Significant break-through has been made in milk production in the recent years in India, particularly in the context of implementing Operation Flood Programmes. In spite of these development, the per capita consumption of milk is just above 110 g in India. To meet the nutritional standards of 280 g recommended by the ICMR, the milk onboard.

CARDS, TNAU, Coimbatore-3,
production is to be doubled and even trebled. The middle- east countries form a very good market for the Indian dressed beef. The poultry egg farming is gaining strategic importance and the broiler industry has got a boon in the recent years. All these indicate the potentials for self-employment by agricultural graduates in the livestock and poultry development.

Marketing service: To handle the increased marketable surpluses of both crop and livestock products, the marketing system must function effectively and efficiently. The surpluses are to be procured, transported, stored and distributed with minimum cost and maximum satisfaction of the consumers and the producers. These again provide ample scope for the young entrepreneurs to venture into new agri-businesses in the years ahead.

Fertilizer trade: The use of major input viz., the fertilizer in increasing agricultural production has grown rapidly from a level of 2.5 million tonnes (nutrients) in 1974-75 to 5.1 million tonnes in 1978-79 and the estimated demand for fertilizer by 1989-90 would be of the order of 14 million tonnes (nutrients). The production capacity of fertilizer plants have also gone up from 90,000 tonnes in 1951-52 to 52,01,000 tonnes in 1983-84 in nitrogenous fertilizers. Similarly, the capacity of phosphatic fertilizer plants had also gone up from 78,000 tonnes to 15,91,000 tonnes in the same period. These developments in fertilizer industry indicate the scope for self-employment by the agricultural graduates particularly in the fertilizer mixing and distribution systems.

Seed materials production: The use of high yielding variety of seeds has become inevitable in modern agriculture. The non-availability of adequate and required quality seed varieties continue to be the major problem faced by the farmers. The production and marketing of seeds involve the application of latest seed technologies. Further, the scope
for organising nurseries for horticultural crops is immense. The absence of guaranteed quality seed materials in the market offers a potential area where the Graduates in Agriculture could venture and apply the technical skill in running small or large businesses.

Chemicals: The use of plant protection chemicals in achieving higher crop yields is well appreciated in modern agriculture and the production of chemicals had also increased substantially. The market share of pesticides utilised by cotton crop was the maximum followed by rice and chillies and vegetables. The production and distribution of plant protection chemicals provide yet another avenue for the self-employment of agricultural graduates.

Processing: The processing industry is still in its infancy. The urban population is swelling at the rate of about 30 per cent in each decade and the purchasing power of the urban dwellers is also invariably getting increased. The lifestyle and the food habits are also undergoing metamorphic changes in the recent years. Therefore, the demand for quality foods, protective foods, and the ready to cook and eat foods is rather on the upswing. The processing industry is steadily growing and in the years to come, the industry could provide ample opportunities for the Agricultural graduates to venture into both production and marketing of processed foods.

Agro-service: The facilitative services in agriculture like custom service, quality control, research, consultancy etc., are the other areas wherein, the Graduates in agriculture could venture into for self-employment. The crop farming, livestock and poultry farming, agricultural produce marketing system, the agricultural inputs marketing system, the processing industry and the agricultural services system, thus, could
provide ample opportunities for self-employment by Agricultural Graduates. The list of new ventures for self-employment by the graduates in agriculture is detailed below:

I. Farming
   1. Crop farming/Seed production
   2. Dairy farming
   3. Poultry/Broiler farming
   4. Piggery farming
   5. Mushroom cultivation
   6. Sericulture
   7. Fruit and Flower plants-nursery

II. Farm Products Marketing
   8. Wholesaling
   9. Retailing
   10. Commission trade
   11. Transportation
   12. Storage
   13. Export trade

III. Farm Inputs Supply
   14. Fertilizer mixing
   15. Fertilizer marketing
   16. Pesticides manufacturing
   17. Pesticides marketing
   18. Seed production and marketing
   19. Farm implements/Machineries fabrication

IV. Food Processing and Distribution
   20. Milk processing and distribution
   21. Fruits and vegetables processing and distribution
22. Oilseeds processing
23. Paddy processing
24. Meat processing
25. Coir processing units
26. Tanneries
27. Sugar mills
28. Cashew processing
29. Breweries
30. Cotton seed oil processing
31. Rice bran oil extraction

V. Facilitative Services
32. Quality control of agril. products
33. Marketing research consultancy
34. Marketing communication consultancy
35. Marketing finance
36. Agril. custom services

Training needs: The next question that arises now, is what kind of technical training and other supportive assistance are required for promoting self-employment? In the undergraduate curriculum in agriculture one or two courses on basics of enterprises management may be offered. At the postgraduate level, some specific degree programmes like Agricultural management, Agri-business management, Agricultural marketing management may be thought of in Agricultural Universities. Short intensive courses to infuse technical skill in the required production area has to be organised to create confidence.

The supportive assistance for promoting self-employment is yet another question that needs answer. The infrastructural facilities are to be created at the agricultural universities to prepare and develop the graduates in agriculture to take up
self-employment in agriculture and related areas. Research and development of new products, preparing feasibility reports or new business venture-plan/projects, building projects profile, conducting entrepreneurial development programmes, etc. may be thought of. Nowadays, the entry of women graduates in agriculture is on the increase and even specific women entrepreneurial development programmes can be conducted. All these could be effectively achieved through inter-disciplinary approach.

Finance: The financial assistance is the prime-mover behind any self-employment ventures. The financial institutions, as such, have no self-employment financing scheme specifically meant for agricultural graduates. Some specific schemes with certain modalities to motivate the graduates in agriculture to take up self-employment projects, may be formulated and implemented by the financial institutions with the Government assistance.

In sum, this paper indicates the scope for self-employment by agricultural graduates in various spheres of agriculture and identifies the new venture possibilities. The need for the development of infrastructural facilities for training and financial support for promoting self-employment among agricultural graduates is also emphasised.
SETTING AGRICULTURAL GRADUATES ON THE FARM

B. V. VENKATA RAO *

There has been an increasing trend in the migration of rural people to urban areas in search of better employment opportunities and the improved amenities of life including entertainment. The tragic aspect is, the intelligent among them go to towns and cities for higher education and they are lost to villages once and for all while the unemployed poor rush to towns in the hope of securing gainful jobs, but soon and up in despair, in slums. The challenge before the country is to work out rural development strategies which make life in the countryside meaningful and thus stem the tide of rural-urban migration.

In this context, the establishment of duly educated-qualified young men and women on land and their subsequent pursuit of farming in its wholesome productive manner, would serve as emulative pockets of light for agriculture and rural living. It would in fact signify a novel extension demonstration strategy. Incidentally, such enlarged effort would provide assured self-employment opportunities to sizeable number of agricultural graduates produced in thousands every year country over. This concept of a farmer living right on the land, engaged in crop and animal rearing along with associated activities, termed as "Resident Farming", "Extended Village Farming", "Scattered Village Settlement", "Family Farming" is receiving increasing attention in the past couple of years. The practice is characteristic all along the West Coast and hilly regions in the States of Kerala, Karnataka and Maharashtra. It is appropriate to consider the main feature of our land and rural scenario in order to gain an insight into the problem under discussion.

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Out of a total geographic area of 320 million ha in the country, 142 million ha have been ploughed. This area of 142 million ha is parcelled into 82 million holdings whose average size works out to 1.8 ha of the 82 million holdings, 44.5 and 147 million average 1-2 ha and less than 1 ha in size respectively. It is evident from this that we have to reckon 60 million farm families, sustaining on these small bits of lands, and agriculture and rural development in India is synonymous with inducting efficiency into production activity of these millions of small land units. In this background, let us examine the land and rural activity as it exists at present.

Unlike America or Europe, India is a land of villages and villagers; there are no farms and farm lands. According to western concepts, a farm can note a farmer with a viable unit of land and a house including a place for his cattle and birds, implements, other accessories and requirements. It is a situation where a person lives on the land he cultivates with his family which helps him to direct his productive efforts to use land, if possible to accelerate and improve upon the natural genetic or growth process of plant, and animal life in order to ensure that the yield is better for the benefit of mankind.

As against this, in India, we have lands and their owners and cultivators who live elsewhere and operate the land during the season through their own and/or hired labour. It is not uncommon as in Black Soil region of the State where rainfed land holdings are large, the only two occasions, village people get busy about the land, once at sowing and the second time at harvesting. The life in Indian villages is subhuman. The village is an agglomeration of houses without any living facilities. Lack of sanitation is the worst part of our village life. It is said that stink one sense while driving on a highway during nights heralds the presence of a village.
A reasonably decent group living presupposes organised sanitary facilities which these villages cannot afford. None of the essential modern civilised living components like protected drinking water supply, roads, drains, sewerage disposal system would be possible under the economic conditions in which our villages are. The only plausible reason for the type of the huddled living is the animal sense of herd security it provides. People appear to feel that they would be exposed to dangers from wild nature and more than that from dacoits if they live apart dispersed in their fields. Perhaps the feeling is the legacy of the insecure rural life of the Pre-British days. In many villages, we see the relics of forts, watch-towers and the like as evidence of people's defence against torch-light bandits, murderers and other anti-social forces. The question is, have we not emancipated in these over two hundred years of orderly government? The magnitude of security or insecurity we have at present is the same whether it be in towns and cities or villages and rural areas. It does not need an isolated countryside to thieve or burgle or loot or kill people. We see it happen in the heart of urban areas.

The solution to increased agricultural efficiency and healthful rural living surely lies in our cultivators and others working on land, living right on their holdings. It straightaway removes the disadvantages of primitive huddled living with its inevitable filth and squalor. A spread out living on farm land provides the rural women and children plenty of fresh air. The children would have enough room to run around instead of unkept streets with pools of effluent water from households running amuck in the absence of drains. The men and women could live all by themselves and for themselves in productive occupations, instead of joining neighbours for idle talk and gossip. Certainly, it does not prevent them from gathering together on occasions such as feasts, social functions, annual gatherings and others.
time spent every day on back and forth visit to their place of work i.e., from villages to lands and driving cattle out for grazing, will be saved.

Besides the incidental benefits considered above, the basic advantage of living on a farm is that the farmer and his family would be enabled to be in wholesome intimate association with land, the productive means of their income and livelihood. The farmer can demarcate his holding boundary through a fence, preferably economic hedge plants or close planted row of trees, build a house or a hut as it suits the climate and his economic situation and allocate his land for different purposes like pasture, food crops, trees for food, timber, fuel and fruits. A medium sized well could provide uncontaminated water for domestic use which at present is quite a constraint in most of the villages. Also, it would help the farmer to plan out a variety of income-augmenting economic crop plants including vegetables, flowers and fruits, depending upon market preference. With the possibilities of fodder availability on the farm, dairy cattle, sheep and goat, poultry, silkworm rearing with a patch of mulberry and such rich vistas of year round gainful occupational activity opens up. Crop and animal residues paves way for a biogas plant catering to needs of energy for lighting and power. Soil improvement through recycling animal and plant residues becomes a reality. This multifaceted crop and animal activity on the farm provides substantial cushion against uncertainties of seasonal rains, besides contributing to wholesome soil and environmental ecology as a result of systematic balanced cover of countryside with perennial trees and other crop plants.

The question is how do we build up this movement of Resident or Family Farming. This could be admirably initiated through the settlement of agriculturally trained young men on land holdings of 1-2 ha in size; region and situation specific
plans for multifaceted activity as conceived above has to be worked out for each farm. The capital outlay for fencing, minimum housing, tree planting, etc. for such a farm may be of the order of Rs. 50,000 which could be provided as interest-free advance recoverable in easy instalments of 5-10 years after the enterprise takes off. There is imperative need for pilot studies through starting of one or two such farms in each district to demonstrate the immense potentialities of resident farming for total rural well-being through sustained land use. The agricultural graduates have the necessary training and also the social obligation to play the deciding role in working towards the success of this movement. It is hoped that the modalities of transacting the idea into a concrete plan and movement in time, would receive the attention of our agricultural experts. The success of the movement would signify unlimited productive occupational opportunities based on their own initiative for products of Agricultural Educational Institutions.

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SELF EMPLOYMENT FOR AGRICULTURAL GRADUATES

JADE SRINIVASAMURTHY*

Agricultural Education leading to graduation has a history of more than 75 years in India. But, in Karnataka it is only 38 years old history with first batch graduating in 1949 at Hebbal, and in 1950 at Dharwar; however, post-metric diploma holders (3 years course) have passed out from Hebbal school since 1920's. Thus for 65 years these technical personnel have come out of this institution. Most of these graduates and diploma holders have joined professional and technical services: Govt. Departments, University, input Agencies, Banks etc, not more than 10 per cent of these have opted for self-employment. (This is also the case even in the developed countries). Agricultural Education at the university level was and continues to be perceived as a technical channel like Engineering and Medicine. As in these cases, the graduates have generally sought employment (however, many graduates in Medicine have established practice). Now, the issue before us is what can be done to motivate agricultural graduates to look for employment?

Need for Employment of Agric. Scientist

Before we answer this question, we need to briefly consider "Why Employment for Self-employment"? Those who subscribe to this view point generally believe that (i) Agricultural graduates with their knowledge of Agricultural Science and related technologies, can develop better understanding of the rural development process and be able to provide proper leadership for technical change and social change, (ii) Agricultural Education even at the College should train the rural youth in Agricultural Technology and

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assist them to settle on their farm or help them to get land or other resources so that they practice new farm technology, which will have demonstrative effect on others (Ripple effects on development pursuit of others). There are also others who feel that agricultural graduates can easily settle in rural areas and not add to the problem of unemployment of the educated. The purpose of this paper, however, is not to support or control these perceptions.

The objective of this paper is to analyse what are the characteristics and attributes that help self-employment? and what measures, are required to assist these Agri. graduates, (Horticulture, Veterinary and Animal Husbandry, Sericulture, Farm Forestry etc.) to become successfully “Self Employed“.

Characteristics and attributes needed for Self-employment

Self-employment to be successful, satisfying and rewarding, requires the following personal characteristics and attributes:

i) Belief that the self-employed has a status in society which is in no way inferior to the highest positions in the services.

ii) Ability to seek challenges in life and succeed.

iii) Orientation to take risks, to face uncertainties and to overcome disappointments.

iv) Enjoyment of hard work.

v) Managerial ability including human relationship

vi) High degree of Achievement Motivation.

vii) Live for natural environment and value orientation in favour of simple life.

viii) Willingness to learn from experience.
It would be too much to expect all these attributes in every graduate in Agricultural Sciences. But, they are aware of these requirements for self-employment. Hence, they generally seek service opportunities where one can manage without these attributes.

One of the issues for discussion in the seminar is “What kind of technological training and other supportive assistance are required for promoting self-employment”.

**Agricultural University’s in promoting Self-employment of their alumni**

The objectives of the Agric. Universities have been not only to impart higher education in Agric. Sciences but to promote research to develop technologies that are appropriate for farming and farm based related enterprises. There are other institutions like Agric. schools, Vocational institutions, Krishivigyaana Kendras, and farmers training institutes which are meant to train farm youth who have settled on land to adopt new technologies. Hence, the focus of Agric. Universities was more on preparing technical personnel who will be responsible for research and extension work. Nevertheless, there were some attempts to orient and train those Agric. Scientists for self-employment. One year vocational course on the university farms and short courses on poultry were introduced. Agric. Universities role should also include specifically (i) technical training for self-employment and also (ii) providing meaningful experiences which will help in developing personality characteristics needed for self-employment.

The following suggestions are made for discussion in this seminar:

a) Introducing vocational courses (non credit) ie. skill oriented courses providing training on appropriate technology which can be immediately used. These courses would be too much to expect all these attributes in every graduate in Agricultural Sciences. But, they are aware of these requirements for self-employment. Hence, they generally seek service opportunities where one can manage without these attributes.

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The following suggestions are made for discussion in this seminar:

a) Introducing vocational courses (non credit) ie. skill oriented courses providing training on appropriate technology which can be immediately used. These courses
should be offered during Trimester brake, evenings during trimester and weekends, for those who are seeking self-employment.

b) Organising farm stay practicals on recognised farms of progressive farmer and successful self-employed agric. graduates farms, to provide opportunities to evaluate the appropriate technologies they have learnt and also to get motivated for self-employment. This may be done on completion of graduation.

c) Periodical 'retreats' in selected locations in interior farming areas, where organized interactions among the self-employed, the self-employment seeking, those who are promoting self-employment, and those who are likely to assist those who wish to be self-employed.

d) Annual meets of 'Self-employed Agric. graduates' at different regional research farms and Colleges, to help organize cooperative action projects among the self-employed to solve problems of resource mobilization, marketing etc.

e) Establishing 'continuing education department' which will provide short courses, correspondence and information centre, courses for self-employed Agric. graduates to acquire new techniques and management strategies to succeed on self-employment individuals.

f) Providing consultancy for formulating and operating self-employment projects. This will help them to evaluate their own project and make it more profitable and also to get needed resources as well as liaison help for marketing.

g) Establishing contact with institutions like Banks, Agro-industries Corporation, input agencies who are promoting self-employment. This will help in carrying out the responsibilities mentioned under (d) to (f).
SELF-EMPLOYMENT OF AGRICULTURAL GRADUATES—PROBLEMS AND PROSPECTUS

RANGANATH MANGALVEDKAR AND B. L. RAMEGOWDA*

The development and prosperity of any country is dependent on its population engaged in entrepreneurship. Agriculture being the mainstay of Indian villages and 70 per cent of Indian population dependent on agriculture, the agricultural entrepreneurship plays a pivotal role in development of Indian Economy. Further, given mounting unemployment problem among educated youth especially the rural youth, it is inevitable for them to take up self-employment by settling on their land or agriculture-related activities, as agriculture is the potential source of employment in India. The severity of unemployment problem could also be seen among agricultural graduates in near future.

Why self-employment of agricultural graduates?

Agricultural graduates play a key role as teachers, researchers, extension workers and also as farmers in ensuring continuous and consistent growth of agriculture. The self-employment of agricultural graduates helps a sound technically trained professional to grow on his own without relying on salary. The other advantages are:

1) An agricultural graduate can react to vagaries of rainfall, incidences of pests and diseases, changing marketing conditions and policies better than an ordinary farmer can do and thereby can increase the land productivity.

2) Well-informed agricultural graduate can act as adoption leader of a locality. He can play an important role in

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information dissemination and can also influence innovation
decision making by other farmers.

3) Agricultural graduates can prove that farming is no
longer a fool's last resort and farming requires careful plann­
ing, adaptation and application of improved agricultural
technologies.

4) Newly evolved agricultural technologies could be
easily channeled through these graduates. Thus the time,
efforts and cost involved in dissemination of these techno­
logies could be considerably reduced.

5) Agricultural graduates settled on farm can serve as
the most trust-worthy and authentic informal localite agricul­
ture information source at village level.

6) Spirit of co-operation can be furthered by them in
production, marketing and processing of agricultural products
which makes agri-business an attractive proposition.

7) Self employed agricultural graduates of a locality may
also assist field extension workers of State Department of
Agriculture or Agricultural Universities to effectively execute
their agricultural programmes by ensuring maximum participa­
tion of their fellow farmers.

8) Self employed graduates, if become office bearers of
Farmers Co-operative Societies such as credit, marketing etc.,
can serve farmers better as they are capable of predicting
agricultural situations and act accordingly in time.

9) Professional growth and success got from pioneer
agricultural entrepreneurs can open the eyes of new coming
graduates to the avenues of self employment.

Status of self employment of agricultural graduates

Self employment of agricultural graduates is still in
rudimentary state. Very few successful examples are avail­
able compared to many other professions, particularly medical
and law professions where there are innumerable number of such examples. There is no atmosphere of self employment among agricultural graduates and farming has been treated as last priority by agricultural graduates. Very few people attempt to go back to rural areas and even among them very few succeeded. Some graduates who had tried to do so have eventually returned to public service. On the other hand some shrewd graduates after govt. service, amassed savings and invested in agricultural entrepreneurship after resigning from the service. Some of them were sailing on two boats and reserved farming as post retirement paying hobby. A few of them self employed themselves in non agricultural business such as hardware shops, photo studios etc., very few of them have taken up agricultural entrepreneurship immediately after graduation.

Opportunities for agricultural entrepreneurship

The opportunities for agricultural graduates for showing their entrepreneurial behaviour is never limited. This can be farming to fisheries, agro-business or agro-industries. In nutshell, these can be listed as follows:

1) Crop production/fruits and vegetable production.
2) Agricultural consultancy particularly in horticultural crops and agro-industries.
3) Agro-business such as fertilizer dealership, pesticides, agricultural implements and machinery.
4) Agro-Industries including Food Industries, Sericulture Industries, Agrochemicals etc.
5) Dairy production, poultry production, wool production, meat production etc.
6) Marketing, import and export of agricultural/horticultural commodities/machinery.
7) Agro service centres.
8) Seed production, cutflower production, establishment of nurseries of horticultural crops.

9) Hatcheries and Livestock breeding farms.

10) Agricultural journalism, publication, film production, video production and other agricultural information, dissemination activities.

11) Agriculture products movement from place of production to place of consumption/agro-industries.

12) Production and sale of indoor ornamental plants.

Reasons for poor participation of agricultural graduates in agricultural entrepreneurship

Although the opportunities are unlimited in agricultural entrepreneurship the non-forthcoming of agricultural graduates has serious antecedents. The reason could be grouped as psychological, social, economical and policy.

1. Psychological: The reasons pertaining to psychology of agricultural graduates related to lack of motivation, fear of failure to step into the field where few successful examples are available. Ability to take calculated and manageable risk was a very significant quality of entrepreneurs (Setty et al., 1984). Achievement motivation may be regarded as most important for a successful entrepreneur. McClelland (1961) suggested that entrepreneurial behaviour involves unusual creativeness, propensity of risk taking and strong need for achievement. Anonymous (1971) enumerated qualities of entrepreneur as having need to achieve, risk taking, strong need for achievement, positive self concept, initiative and independence, problem solving ability, hopeful about future, searching environment and timebound planning. Affiliation motive may also help in remaining in rural areas. But power and recognition motives may not help much in entrepreneurial behaviour. In fact they may help them to seek
more lucrative white collar jobs. Most of the agricultural graduates lack sufficient achievement motivation and risk taking behaviour to venture into agriculture or agri-based industries.

2) Social : The main reason for agriculture graduates for not taking up farm entrepreneurship is that the eyes of society are not yet open to consider farming as a serious business that can be taken up by educated people especially the agricultural graduates. Agriculture profession is valued low by members of the rural society. They link illiteracy with farming, education with job. Besides society, within a family itself the authorities of farm decision making are concentrated with the heads of the family, thus providing no freedom for educated youth to take initiative. An outward system changing the social system is not taken as normal. Hence total atmosphere is not conducive for graduates to settle on their farm.

3) Economical: The present high yield based, agricultural technologies are capital intensive. Majority of the graduates come from middle class families which are devoid of huge investments required for farming. The small size of business if started will suffice only hand to mouth existence and does not offer any opportunity for growth. Also, all families of graduates do not own economical holding or do not possess any holding. Moreover agricultural business is known for suffering from vagaries of rainfall, changing market conditions, incidence of pests and diseases, spoilage of produce and changing policies. Any change in certain aspects increase the total risk.

4) Policy : No other policy is so obscure as land policy. At one end in the wake of socialism the land is owned by poor farmers who have only land and labour to offer and
At the other end there is capital and management rich population who are barred from entering farming. The result is poor productivity which is the outcome of natural law of limiting factors. Any agricultural graduate with this policy limitations will find no motivation for entering farming business. Likewise price policy marketing and tax policies relating to agriculture are far from satisfactory.

Incentives for encouraging agricultural entrepreneurship among agricultural graduates:

It can be seen from the preceding discussion that the atmosphere for agricultural graduates is not conducive for self employment and necessitates right incentives from government and other agencies.

1) The existing incentives pattern for agricultural graduates is far from satisfactory. Although, there is a provision in some states to allot agricultural waste lands to agricultural graduates, the bureaucratic set up is making it a difficult task to get this benefit. Therefore, state government may restructure the procedures to hasten the process and to allot at least 4 hectares of land on priority to agricultural graduates, interest free loan/seed money for irrigation and development of land to be given liberally.

2) Agricultural graduates desiring to settle on their farm or to take agriculture related business have to be given a loan of Rs. One lakh with subsidy of Rs. 25,000 without insisting on security such as land etc. These activities may involve marketing and processing industries. And also loans should be given for landless graduates to purchase lands as well as for land development works.

3) Exemption to be given to agricultural graduates from land ceiling and leasing in barriers. Agricultural graduates should be able to get land by lease for at least five years and able to purchase afterwards.
4) Agricultural graduates should be registered as growers of hybrid seeds, planting materials on priority basis.

5) Incentives to be given for agricultural graduates for entering agricultural journalism, publishing work, film production and videoproduction relating to agriculture.

6) Incentives to be given for taking leadership in cooperative collective farming societies especially involving small and marginal farmers.

7) Agricultural graduates who are employed for 10-15 years and desire to take up entrepreneurship may be allowed with full retirement benefits.

Role of Agricultural Universities

Agricultural Universities have unique position in encouraging agricultural entrepreneurship of agricultural graduates.

a) Restructuring the curricula to give confidence for self employment in varied agri-based fields.

b) New courses suiting to varied challenges, like management, export oriented marketing have to be initiated.

c) The practical to theory ratio in degree programme shall favour practical. Practicals have to be conducted in the real farm situations.

d) Farm management experience for one complete year or at least 6 months has to be provided for agricultural graduates on par with house surgeonship for medical profession.

e) Admission to degree programme should be done in favour of those who have aptitude for farming and agriculture related business but not necessarily on rural background or merit.
f) Success stories of alumni of Agricultural Universities to be disseminated among degree students and graduates and opportunity to visualise the success in course curricula to be provided.

g) Agricultural Universities have to institute honours and awards for its alumni who are successfully self-employed.

h) As it is in USA, agricultural Universities should provide provision for self-employed agricultural graduates to register any agriculture-related courses of the University in which they want to specialise to meet their professional need.

i) Universities must conduct trials or front line demonstrations in the self-employed graduates' farm to quicken the process of agricultural production and propagation of ideas.

j) Since Agriculture is dynamic in nature, universities have to maintain continuous contact with their self-employed graduates to get continuous feedback about field problems to provide suitable solution in time.

k) While organising training programmes, Universities should give special preference to self-employed agricultural graduates.

l) The Universities should provide forum for agricultural graduates to encourage free exchange of ideas among themselves. This could be done by organising seminars, workshops etc.

m) Distance teaching efforts of Universities may also be channelled through these graduates as they are in a better position to understand, interpret and propagate the agricultural messages to their fellow farmers.
With all these efforts one can hope to create an atmosphere for growth of self employed agricultural graduates.

References


SELF EMPLOYMENT OF AGRICULTURAL GRADUATES:
SOME SUGGESTIONS

P. BASAVAIAH*

At present most of the graduates in disciplines like Agriculture, Veterinary and Animal Husbandry Sciences, Fisheries, Sericulture, Horticulture, Forestry, Agricultural Engineering, from various Agricultural Universities depend for employment on some other public or private institutions. Very few graduates are willing to take the risk and accept the challenges to become successful entrepreneurs in rural areas. This is primarily because of the type of education given to the students during their education. The present education is more theoretical than practical. Hence, the whole education has to be redrafted thoroughly to imbibe a sense of confidence and practical skills to our graduates.

It is very essential to train our young men both physically and mentally for accepting the concept of self-employment. In this respect, the following steps have to be taken:

1) Identify students at the time of admission regarding their aptitude for self-employment.

2) The identified students should be given extra training in developing a system of farming suitable to them and to the place where they want to settle down ultimately.

3) There should be continuous interaction with the parents/guardians regarding the progress in the training of students opting for self-employment.

4) After assessing the investments a student can make for self-employment, additional resources essential to complete the program has to be identified.

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5) Involvement of the State Govt. will be essential to provide them adequate resources like land, non-agricultural land, electricity and other inputs provided by the Government institutions.

6) Involvement of the Bankers to help and extend the necessary financial assistance is essential.

7) Just like in industries, single window approach will be essential to make the program of self-employment successful.

8) Agricultural student can be a single person or a group of persons willing to work together.

9) These self-employed youth should be encouraged to train the local youth in varied aspect of agricultural production.

10) There should be encouragement to organise co-operative societies with the sole objective of marketing the agricultural produce at reasonable prices.

The Agricultural Universities, the State Development Departments, Marketing Organizations should extend all technical help on priority to these students taking up self-employment. They should be nominated to serve in the organizations involved in rural development. These centres of growth, should be as far as possible distributed all over the region, state or nation, so that the concepts of development, reaches all the people within easy access.

The Agricultural Universities should identify the teachers, who are willing to take up the additional work of helping these people opting for self-employment, on a voluntary basis. Special efforts should be made to help students from socially and economically backward sections to take up the challenges of agricultural entrepreneurship. A special cell should be
created in the Agricultural Universities to help the self-employed graduates.

These self-employed graduates will settle down in rural areas and act as centres of growth. These will make the science and technology easily accessible to the farmers in the villages. All these activities will enable the creation of more remunerative employment opportunities in rural areas; the socio-economic degradation that is manifest in the villages can be arrested and it would be possible to make the village communities prosperous again.
A PERSPECTIVE FOR AGRICULTURAL EDUCATION AND
SELF-EMPLOYMENT OF AGRICULTURAL GRADUATES

N. S. P. REBELLO

Formal agricultural education has been in vogue in the State for half a century. Yet, though there has been some change in content, there has not been a substantial change in its structure. While such structural change admittedly was necessary in the past, it is certainly essential to meet the challenges in the future. Some of the reasons, requirements and solutions have been discussed here.

While much normative thinking has gone into making education relevant to the needs of the time, positivistic approaches to make it a reality have been woefully wanting. It is necessary to ask firstly whether the current agricultural education in the Universities is ‘relevant’. Agricultural curriculum leading to a bachelor’s degree had focussed in past on the needs of the department of agriculture, as the sole consumer of the graduates. The Department of Agriculture itself has undergone a change in outlook—it has moved from the ‘dissemination of improved technology, information and services’ to the ‘management of resources’. Extension personnel are no longer concerned solely with teaching the farmer how to do something better, but also what to do with his resources to increase returns, when additional resources need to be obtained in order to achieve this, and how to do it. This requires considerable skill in economics and public relations-cum-extension. Training in social sciences need to be upgraded considerably at the undergraduate level, if the extension workers are to be equipped to fulfil their responsibilities. Further, the employment horizon for graduates has

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expanded considerably in recent decades. Banks, agricultural firms, plantations, supply and service institutions, even manufacturers of agricultural inputs, have commended employing agricultural graduates. Another change with far reaching consequences is the entry of young women into agricultural education; they account for almost a third of the intake into agricultural colleges currently, as against a negligible number two decades ago. The restructuring the curricula has become imperative, if higher agricultural education is to be relevant.

Self-employment in agriculture has been a goal of agricultural education from the very commencement. It has been the aspiration for many decades and has been much talked of, yet never realised in spite of promise of ‘assistance and incentives’ by government. The main cause has been the existence ‘pests and diseases’ should we say ‘predators’, which swarm around would-be entrants into private enterprise. While the above aspects have been recognised by most persons with vision, no effort has been made to study the same in detail—to investigate man-power utilisation, to estimate trends and requirements, whether current or for the future.

Man-power studies are the first step in developing a perspective for agricultural education. It is not only necessary to identify current and future employers, their recruitment policies and demand, but also the job requirements and descriptions, desired skills, and faces of professional competence. This information is essential to decide the areas in which degrees are to be offered, the areas in which major fields need to be established and the number that need to be trained in each of these. The second step would be to restructure education curricula to provide not only the requirements in different areas and major fields, but also a minimum flexibility giving students the chance to shift between fields if necessary, as also to acquire additional skills if they desire to
do so. Finally, the requirement of personnel for teaching, indicating the specialisation and number, needs to be decided upon, if agricultural education is to be relevant and meet the emerging needs.

Self-employment has been the lofty ambition of agricultural education for decades. Training of agricultural graduates in scientific cultivation and modern technology, in order to ensure greater agricultural production, has been a cherished goal. But pathetically this ideal has remained a will-of-the-wisp. This has been mainly due to the dicotomy between theory and practice. As in all higher education in the country, agricultural graduates get enamoured with high income and job security obtainable in enterprises in the urban sector. Their aspirations in this regard, especially in respect of the standard of living, are unattainable in the rural sector. If the goal of self-employment is to be achieved, it is necessary to study in detail these requirements and endeavour to provide them.

The prime requirement is land. In spite of various promises to provide suitable land to agricultural graduates, such schemes have never come into being or been implemented. If at all, agricultural graduates have to depend upon inherited land to take to self-cultivation, the income levels they envisage can be achieved only with a large area of the farm, which is rarely available. Inherited farms are generally too small to provide the level of the income desired and there is little opportunity to expand them under the existing legislation and set up.

Another requirement to achieve a reasonable income level is capital. This is required to improve the land, as also provide machinery, inputs and services required for modern agriculture. Here again much promise has been held out, through institutions such as cooperatives, banks, as also special programmes by the government. Yet, in implemen-
tation the hurdles and constraints have been so great that the few who had ventured into self-employment have generally come to grief. Procedures are time consuming and expensive and corruption is rampant. The result is that even when the funds become available they are either too expensive or too late or both.

Yet another aspect that is vital to self-employment is an assured flow of income—security of income. Such steady and assured income is possible only under irrigation, in most cases. Irrigation itself is highly capital intensive and puts great strain on the capital resources of self-employed graduates. The difficulties in borrowing enumerated earlier apply here too. While a few may have inherited farms in areas that are brought under irrigation projects, most are unable to secure land in irrigation areas.

Marketing is extremely important in the context of self-employment. In fact it is a decisive factor in the procurement of inputs, as well as the disposal of products. Under intensive cultivation the chances are high that products such as vegetables, fruits and flowers, milk, eggs, meat and other perishable products will predominate. It becomes, therefore, absolutely essential that a good marketing structure be made available before self-employment in agriculture can flourish.

Last, but not the least, is the aspiration for a good standard of living, which most young people with higher education develop as a part of urban-living. Educational institutions for the school-going children, health facilities, as also recreational and entertainment opportunities play an important role in attracting graduates to rural living and occupations. These are weefully lacking in all rural situations in the country, where graduates from agricultural institutions are likely to find opportunities for self-employment. The result is frustration and disappointment—even the few who take to it ultimately que up for urban employment out of disappointment and disgust.
It goes without saying, therefore, that much needs to be done if agricultural education is to achieve its lauded objectives, especially self-employment. Studies need to be undertaken to understand the present situation and the future to a reasonable extent. Curricula and education facilities have to undergo structural changes to be able to provide the type of skills and the level of man-power required. The institutions set up by government and the economic structure will have to be modified so that rural life comes reasonably close, if not equal to the expectation of income and the living standards, in urban locations.
FARM GRADUATES IN AGRICULTURAL DEVELOPMENT: "THROUGH SELF-EMPLOYMENT"
H. G. SHANKARAMURTHY AND H. A. RAMAKRISHNA*

Predominantly agricultural-based, as India, is the role of agricultural education in relation to self-employed farm graduates cannot be over-emphasised, while we envisage agricultural output and productivity. It has been estimated that only two per cent of the total number of farm graduates are self-employed on their farms. The rest are absorbed in Government factories and private firms, agricultural universities and research institutes, Government departments of agriculture and several other banking organizations. What a state of affairs?

How unfortunate that the tendency now-a-days has swerved to acceptance of white collar jobs, instead of taking up the right challenges of being self-employed on one’s own farms. Instead of being Masters, the farm graduates, on a large scale, seem to be content in serving their calling somehow. Indeed most of them lose an opportunity in building up a new rural India, allowing its destiny to shape itself in its own way.

Many are the ways of strengthening the infrastructure of the rural economy towards progressive development. At least, a few deserve to be mentioned in this context:

1. The self-employed farm graduates can act as an effective link in transferring the technical knowhow in their own farms, to start with,
2. This can surely penetrate the neighbouring area sooner or later;

*UAS, Dharwad and UAS, Bangalore respectively.
3. As an attractive source of income, they can engage themselves profitably in the production and processing of hybrid seeds, through their skills and specialised orientation.

4. Expansion of the area under HYV seed can quicken its pace and this contributes largely to the advancement of the rural economy.

5. The management of the most important resource is ingenuity besides other resources like land, labour and capital in agricultural production. The self-employed farm graduates invariably possess better managerial capabilities compared to any other category of educated farmers. Thus, the farm graduates can contribute to the rational utilization of scarce resources. Add to this, the farm graduates can associate themselves with the better management of service co-operative societies in their areas.

6. Consultancy services, on the part of farm graduates, provide them the respectable means of income and this line of action brings about many changes in the mode of cultivation of crops.

7. They can provide local leadership in the management of co-operative institutions, engaged in input as well as output marketing at different levels.

   Especially so, in the management of the primary service co-operative societies which are the true kingpins of the Indian co-operative structure. Since the success or otherwise of the entire co-operative sector depends decisively on efficient functioning of these primary service co-operatives, the farm graduates can take a leading role competently.

8. The knowledge of agricultural engineering to which the farm graduates are exposed helps them in advising the
local farmers to effect common drainage system. And further, they can adopt group/community approach in plant protection against pests and diseases.

9. Wherever the land holdings are too subdivided to be used profitably, as seen as fragmented pieces in the extremist position, the farm graduates who have understood the magnitude of inconvenience regarding problems of management of the scattered parcels of land, can try and implement the consolidation schemes of plots very successfully with the help of government programmes, thereby solving the evil effects of disintegration of an otherwise possible and appreciable cultivation.

10. In order to encourage the farm graduates to settle down in rural areas, the Government of Karnataka has come out with a scheme of allotting 10 acres of land; and banks have their own programmes to help liberally such graduates financially through short term and long term credits. The end utilization of such loans by self-employed farm graduates might influence/educate the village farmers, in resorting to better utilization of loans. The increased returns through increased sales contribute to regular and prompt repayment of loans which would go a long way in reducing the problems of bad debts, experienced by most of the financial institutions.

11. They can actively participate in the working of village panchayats and schools, in addition to working with village co-operatives, thereby enhance the overall improvement of the rural segments through these three pillars of democracy, as self-contained propositions.

12. It is possible to build a cadre of legislators who could be quite concerned with the rural development in general, and agricultural production in particular.
13. The young cadre of farm graduates can effectively get all the programmes and plans implemented by the development administration of the state government in their regions.

Hence, there is vast scope for farm graduates in restructuring the rural economy towards betterment of conditions substantially. This will be a far greater committed service than what is possible through white collar jobs in various organizations. That is to say, spreading of agricultural education and technology is the need of the hour to ensure national progress and prosperity. This would make the saying of Gandhiji: "Go back to Villages", a living reality for constructive reasons.
SOCIO-ECONOMIC CONSTRAINTS IN SELF-EMPLOYMENT OF AGRICULTURAL GRADUATES

CHICKAVENKATESAIAH and P. N. SUBBA REDDY*

Introduction

The problem of unemployment is assuming gigantic proportions in developing countries. It is more so in the countries which are wedded to capitalistic mode of production and distribution. India is no exception to this. In 1983 there was an unemployment of about 20.74 million in the country. At least 5.6 million are added every year to the unemployment market (Nalayadi).

To tackle this crucial problem several programmes are being undertaken by the Government of India as well as by the State Governments. Reforms are being introduced in our education system. Job-oriented education is the demand of the day and it is on the increase; Universities, Institutions of Technology and other institutes which impart technological knowledge in Medical, Engineering, Agriculture etc., have increased. Schemes such as 20-point programme, new 20-point programme, National Scheme of training of Rural Youth for self employment, National Rural Employment programme are under implementation to generate employment and to improve the living standards of the people.

National Scheme of training of Rural Youth for self-employment trains thousands of youth in the age group of 18-35 years. They are trained in jobs such as Sericulture, Horticulture, Animal Husbandry, Carpentry, Smithy etc. Those who are trained under these schemes are helped in applying for bank loans and subsidise and to start their own.

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enterprises. According to reports, the Rural Youth numbering more than 7.3 lakhs have received training under "TRYSEM". More than 55% of them have taken up self-employment after completion of training.

In a situation like this 20 and odd Agricultural Universities in the country are adding thousands of graduates to the unemployment market every year. Karnataka is one of the states in the country having two Universities of Agricultural Sciences. The other channel is non-institutional source namely self-employment. The avenues available for self-employment are (1) cultivation of land (2) starting of Agro-based Industries (3) Marketing of Agricultural goods and (4) consultancy services on agriculture.

Cultivation of land profitably pre-supposes certain requirements. In the first place sufficient land is required, that too fertile land with assured irrigation facilities, auxiliary facilities like pumpset, pump-house, farmshed and connected agricultural implements. The pressure on land is so much that there are millions of landless agricultural labourers in the country. In such a situation getting land with all the facilities is a remote possibility. The Agricultural graduates who want to take up farming as a main source of living has to reside at the farm facing the vagaries of nature, such as extreme chill during winter, rainy season and hot climate during summer. The adopt to such, our Agricultural graduates are not adequately trained. They can not stay on the farm, because all along they are brought up in hostels located at the urban centres and accustomed to sophisticated life.

To illustrate this point the student of B.Sc. (Agri.) degree programme in the University of Agricultural Sciences Bangalore has to complete successfully 192 credits to take up his degree in B.Sc. (Agri.). Out of the 192 credits he is exposed to field work only in about 6 credits in Agronomy, 6 credits in Extension. Rest of the time he has to spend within
the four walls of a class room or in the hostel. Such being the case we cannot expect any agricultural graduate who settle on the farm to give intensive care to the farm activities and to supervise farm work.

The other possibility is to start an Agro-based Industry. This again requires the fundamental facilities like land conveniently situated near railway station, bus stand and marketing place. Securing such a land needs huge investment. If we examine the possibility of Agricultural graduate taking up marketing as a means of self-employment he has to take the same difficulty of initial capital. Marketing of goods need huge capital for the purchase of commodities, storage facilities and transportation. No Bank advances/loans without proper security.

A venture which can be undertaken with minimum capital is consultancy services. In India private consultancy services in Agriculture have not developed for several reasons. One of the major reasons is the average Indian farmer is poor, he has no financial capacity to consult agricultural experts every time he raises a crop. Added to this there are several extension agencies sponsored by the Government, Universities and Research centres which disseminate information free of cost. Mass media like Radio, Television, Newspapers and Magazines also disseminate information on Agricultural practices. In addition, the farmers are trained by Govt. agencies in informing and other allied activities free of cost.

Apart from these economic constraints there are some social constraints which also act as a barrier for agricultural graduates to take up self-employment. Over a period of time, the Govt. service has created an impression in the mind of the public that it is the most secured and honourable profession. As long as he is in service he gets salary, after retirement he gets gratuity, provident fund, insurance and pension. Thus, a sense of security underlies the Govt. service. The parents,
relatives, friends and well-wishers always advise a person to take up self-employment. Moreover a Govt. official enjoys better status in society than men in other avocations. The security of life in Govt. service and high status it bestows upon a person motivate agricultural graduate to give up the idea of self-employment however remunerative it may be.

Apart from these there are other sociological constraints like, the rigid caste-based occupation system which act as an impediment. According to the value system certain occupations are socially rated high and certain occupations are rated low and meant only for certain cast. Thereby the graduates coming from caste whose traditional occupation is other than agriculture do not prefer to take up farming. The same is the case regarding other occupations like marketing, processing and industry.

In the existing situation of overwhelming unemployment among graduates, it is necessary to induce them to take up self-employment. To achieve this object, he has to be provided with all the needed infrastructure facilities like land and capital without sealing. For the purpose of identification something like a green card is to be given to every agriculture graduate as soon as he comes out of the college.

All nationalised banks should have instructions to provide him interest free credit without insisting on security. Credit limit should be fixed by the experts depending upon the nature of enterprise he undertakes. Government has to subsidise the loan at least to the extent of 50% for the first five years. The government and semi-government agencies should have instructions in giving first preference in the purchase of goods produced by him. He should be exempted from legal formalities like taking licence, alienation of land etc., to start an industry. The surplus land resultant of land reform should be allotted to him on priority basis.
To improve his social status in society, he must be co-opted as member in all democratic institutions like Mandal Panchayats, Zilla Parishads, Co-operative Societies and Land Development Banks of his locality. Mass media are to be geared up to give wide publicity to the enterprise he has taken up. He should be encouraged in all walks of life so that he feels secure and his status elevated. A impression is to be created in the minds of the public through publicity and propaganda that a self-employed person is equally respected as that of his counterpart in Government service. In addition to the above, steps should be taken to reorganise the agriculture education in the country. It should be more of field and job-oriented one than classroom education. He should be adequately trained in the field to face hazards of nature such as chilly, hot climate and other vagaries of nature, so that he can develop confidence to stay on the farm. As a part of his degree programme he should be attached to a reputed farmer at least for a period of two years, before he is conferred a degree in B.Sc. (Agriculture), say, he should be trained both in manual work and cheerful exercise.

Reference

FUNDING AGRICULTURAL UNIVERSITIES:
NON-CONVENTIONAL SOURCES

H. M. NAGABHUSHANA*

I. Introduction

Agriculture has been and will continue to be the economic and social base of rural India. Rural population is becoming more and more conscious of the outcome of the Indian Agricultural University system. In the United States of America, the Land Grant Colleges were established more than hundred years ago with the passing of 'The Morrill Act' (July 2, 1862). On the same model, the first Agricultural University at Pantnagar was established in 1960 in the Country. At present, there are 26 such Universities, spread over the entire Country and are mainly funded by the State Government and the Indian Council of Agricultural Research (ICAR). They have been established for the purpose of imparting education in different branches of Agriculture and allied sciences, for furthering the advancement of learning and research, and undertaking the extension of such sciences and technology to the rural people. It is expected that they continue to promote the interests of rural India through an appropriate knowledge base. It needs hardly any emphasis that adequate amount of funding to these Universities is a pre-requisite condition for effective operation.

II. Financial Support

1. Conventional Sources of Funding

Agricultural Universities are mainly funded by two conventional sources, namely, State Government and ICAR. The

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State Government provides non-lapsable maintenance grants annually to meet the estimated net expenditure on the activities which are necessary for the functioning of the University. Besides, it provides plan grants for development of education, research and extension education.

The second source is the ICAR which provides grants not only for the development of the University, but also towards research and certain extension education projects, either as 100 per cent grant or on a sharing basis.

Internal revenue realised from research stations, students’ fee, rent on buildings etc., in a way is also available to meet the gross estimated expenditure of an University.

While these are the main sources of fund at present a small proportion of funds also comes from 'Other Agencies' which source has to be developed into a significant one, as a "Non-conventional" source.

An analysis of the flow of funds from various sources in respect of University of Agricultural Sciences (UAS), Bangalore from 1965-66 to 1984-85, the following picture presents itself:

The State Government grants which stood at 45 per cent of the total receipts of the University from all sources during the first five years (1965-70) has gone up to 60 per cent in the last five years (1980-85). For the same period, ICAR’s share has decreased from 45 to 20 per cent. In case of

** See for details: (1) "Financial Management and Performance of University of Agricultural Sciences, Bangalore, Karnataka" presented by the author in the XV Annual Convocation of IAUA held at Rajasthan Agri. University, Udaipur, during Oct. 4-6, 1987.

(2) "Sources and Purposes of Funding Agri. Universities : A Case study of the UAS Bangalore" presented by the author in the XI Annual convention of the IAUA held at TNAU, Coimbatore, during Sep. 2-22, 1989.
internal receipts, it has increased from 9 to 15 per cent and that of 'Other Agencies' has gone up from 1 to 5 per cent.

Generally the grants provided by the 'Conventional Sources' at present are found to be significantly inadequate. Keeping this in view, in the VIII and XI Annual Conventions of Indian Agricultural Universities Association (IAUA), it was recommended that the non-plan grants (maintenance grants) provided by the State Governments should not only be fair but also adequate. In the absence of a standardised 'formula funding', the Agricultural Universities are not getting their share of grants on equitable basis. In this regard, a broad 'formula funding' has been considered by the IAUA recently (October 4 6, 1987), and when the same is adopted by the Agricultural Universities and the respective State Governments, it could be expected that most of the on-going programmes of the University would receive fair and adequate funds.

In respect of plan grants provided by the State Government, the IAUA has recommended that the State should allocate 1 to 2 per cent of the total State Plan outlay or 10 to 25 per cent of the total State Plan allocation to the agricultural development in the State, which shall be in addition to what would be provided for under non-plan, to the Agricultural Universities of the State. In this context, it is worthwhile to note that the State Plan allocation to the UAS, Bangalore, was Rs. 81.00 lakh during 1976-77 and the same has been enhanced to Rs. 200.00 lakh during 1984-85. Though in absolute terms there has been a remarkable increase, but as a per cent to the total State Plan outlay it has declined from 0.38 to 0.31 during the same period. Similarly, as a per cent to the total plan allocation of the Department of Agriculture alone, UAS share which stood at 6.71 during 1976-77 has declined to 3.12 during 1984-85.
The position is generally the same in respect of several of the Agricultural Universities in the Country. This exhibits the poorer plan allocation towards agricultural education, research and extension. This calls for higher allocation at least to the levels recommended by the IAUA, so as to make these comparatively infant Universities operationally viable and effective as well as productive in terms of their impact on the State agriculture and rural development.

Another important recommendation of the IAUA is that the State Government shall not deduct the 'internal receipts' of the University while determining the non-plan grants. Modification to the present procedure of deducting the internal receipts would act as an incentive for mobilising more and more of internal receipts. Then only the internal receipts of the University could become a source of additional funding to the Agricultural Universities. Otherwise, greater the Universities generate their internal receipts, the lesser will be the State grants for maintenance under non-plan.

There are a few areas in which the Agricultural University can generate more of internal receipts. Several of the agricultural research stations owned and managed by the University are mostly inherited from the State Government. Many of them are endowed with either barren or marginal lands. A few good patches found here and there are always set apart for research work. The rest of the area remains non-remunerative. This calls for heavy investment on land development, creation of irrigational and other infrastructural facilities. In the absence of adequate plan grants made available by the State Government, followed by deduction of the total internal receipts of the University while fixing non-plan grants, the Agricultural Universities are unable to make its research stations viable farms. In case the State Government permits to retain the internal receipts with the University, it could plough back its receipts for the improvement of these research stations so that in the long run they could generate higher return in relation to the funds invested.
and also in terms of research output. Thus, this will be an elastic source of revenue which is directly related to the extent of investment made on the farms. Further, elasticity could be brought about by taking up a few other remunerative subsidiary activities like poultry, piggery, sheep and cattle rearing, bee-keeping, sericulture, fish-culture, agro-forestry, horticulture etc. on the farms. This also needs additional investment. In order to develop agricultural research stations into excellent research and extension education units, additional investment is highly essential.

Another important internal source of income to the University is the 'Student fee' for instructions. This is a major source of income in most of the developed Countries. In the case of 14 Southern State Universities in the United States of America, the average annual expenditure incurred per student was £ 2718 in 1982 and the average annual tuition fee collected per student was $ 808, which is around 30 per cent of the cost of instruction. Such a fee structure has been adopted in these State Universities after a great deal of deliberations to accomplish the following goals:

- to respond to the State’s desire for the students and the State tax-payers to share equitable proportions of cost of instructions;
- to encourage students to become cost conscious consumers of the University education;
- to see that the students know well in advance the planned increase in fee structure.

Compared to the above situation, the position prevailing in most of the Indian Universities, particularly Agricultural Universities, is dismal. For instance in the UAS Bangalore, the total fee collected from all students per annum is just 0.5 to 1 per cent of the annual cost of instruction per student. The position may not be different in other Agricultural Universities in India. One may not tally agree to collect the full
cost of instruction, but it is also not desirable nor realistic to keep the tuition fee as low as this. In this context, it may be desirable to fix a minimum of 25 per cent of the cost of instruction as the tuition fee. This could be implemented over a period of time by enhancing the existing fee structure, each year by 15 per cent till it reaches the recommended level, so that ultimately the State tax-payers will bear 75 per cent and the individual beneficiary will be paying 25 per cent of the cost of instruction. This will certainly create cost consciousness among the students and their guardians, seeking higher technical education. Besides, differential fee structure could also be thought of for different post-graduate and under-graduate degree programmes.

2. Non-Conventional Sources of Funding

This is an age of specialisation and diversification. The demands of the public on the University for new teaching programmes at different levels, for new technologies and the need to carry the fruits of research to the needy rural community are on the increase. To meet these growing demands, the Agricultural Universities have to achieve an accelerated rate of growth in their sphere of activity. As the grants provided by the conventional sources as on today are found to be highly inadequate to meet the situation, it is highly imperative that the Agricultural Universities should look to other ‘non-conventional sources’ of funding to bridge this growing gap.

Every Agricultural University has specified goals and objectives to be achieved by way of its output, which are as follows:

1) Students graduated
2) Crop varieties
3) Animal breeds
4) Technology output covering the areas of agriculture, animal husbandry, veterinary, dairy, fisheries, pesti-
cides, control of pests and diseases, farm implements, machinery etc.

5) Basic research output

6) Extension education output in terms of training, trials and demonstration etc.

The agencies on whom the Agricultural Universities will have to depend upon largely to mobilise funds for their development in future could be mainly from the 'Consumers' of University output.

Under the category of 'Consumers', it may be possible to list out:

1) Public Institutions:
   a) All State Development Departments, which are committed to development of agriculture and allied sectors in particular and rural development in general.
   b) Semi-Governmental Organisations like Command Area Development Authorities, Dryland Development Boards, Directorate of Sugar, Corporations like Animal Food Corporation, State Seeds Corporation, Agro Industries Corporation, Marine Fisheries Development Corporation, Commodity Boards like Silk Board, Coir Board, Coconut Development Board, Coffee Board, Cardamom and Spices Board, Federations like Milk Federation, Agricultural Marketing Federation, Co-operative Institutions like Sugar Factories, Agricultural Produce Marketing Committees, Regulated Marketing Committees, Scheduled and Co-operative Banks and other Public undertakings operating in the field of agriculture and allied sectors.
2) Private Organisations:

All private organisations/firms which are directly engaged in agri-business, such as firms engaged in the business of seeds, pesticides, fertilizers, agricultural implements and farm machinery, laboratory, equipments, etc. Farmers Associations like, Seed Growers, Sugarcane Growers, Cotton Growers, Tobacco Growers, Planters Association, etc.

3) Alumni of the Agricultural University.

4) Other public and private organisations and a large number of philanthropists, who are interested in the Agricultural University activities.

As consumers of Agricultural University output State Development Departments may set apart a minimum of 10 per cent of their total development outlay and in respect of semi-government Organisations, Corporations, Federations, Commodity Boards and others, 10 per cent of their net profits for being transferred to the Agricultural Universities as grant or towards specific programmes of their interest. Such a funding will be advantageous both to the University and the funding agencies. An active involvement of these institutions with the Universities will create mutual trust and generate desired results.

Alumni of the University could be one other important source, which has a moral responsibility for supporting the University activities, since they are the direct recipients of the University benefits in the form of technical knowledge with the help of which they are thriving well in their private or business life. They must be enthused to contribute a part of their business or professional earnings, besides mobilising support from the general public for the University activities.

Apart from the above mentioned consumers of Agricultural University output, University could mobilise funds, though limited, from a large number of private individuals who
are interested in the Agricultural University mission. Attempts could be made to obtain donations and endowments for offering fellowships, scholarships, and gold medals to students. There may be a few individuals who could donate land and buildings for the establishment of new research stations in the regions where there are none, and are needed to serve the rural community.

Unlike the situation prevailing in the advanced countries, the Agricultural Universities in India have not developed close linkages with the private and public institutions. Both have remained shy towards each other. As a result, the Agricultural Universities are likely to produce graduates and conduct research unmindful of the requirements of the consumer institutions. This would come in the way of complementary roles expected of both the 'parties' in transforming rural India. The real growth and development of any University depends not only on the funds and other resources it possesses and receives, but also how actively it is associated with the consumers, including the rural community. A close linkage will enable the public to recognise the Agricultural University as a fountain of technology, available for the growth of private and public undertakings as also a catalyst of rural development.

At present, the system of "incentive" is not in practice within the Indian Agricultural University system to motivate the scientists to prepare projects and programmes which are acceptable to the public and private agencies for funding. Probably a scheme of incentive would be a desirable system in the light of the fact that the Agricultural Universities are attempting to explore non-conventional sources of funding, a new area. Towards this end, the efficiency of the University scientists and administrators lies in the way in which they could sell their projects and generate useful and acceptable technologies.

In addition to selling of the projects, it is also necessary to establish "Consultancy Service" for the benefit of business
organisations which will also bring in additional resources to the University.

Establishing "Foundations" by the Agricultural Universities as done by a few of the Land Grant Colleges/Universities in the United States of America could be yet another way of attracting public as well as private funds for meeting the financial needs of the University.

Though it is prevalent in Europe, USA and elsewhere, the system of obtaining "Patents" is still to establish its footing in Indian Agricultural University system. Such a system not only provides regular flow of funds to the University but also creates social responsibility on the part of the University for maintaining quality of work and for developing useful scientific technologies.

III. A Word of Caution

Induction of more and more funding by 'Private Agencies' to the Agricultural University system is both a 'hero' and a 'villain'. As a hero—additional funds always bring in growth and development for furtherance of the mission of the University. As a villain—it could pollute the 'chaste' internal as well as external environment of the Agricultural University system. If unchecked, a day may come when Universities would surrender their mission and become handmaids in the hands of a few private agri-business agencies or individuals. Through pressure groups, there is a possibility of over-emphasising certain areas of research at the cost of others.

IV. Conclusion and Recommendations

Having realised the need for mobilising additional funds from non-conventional sources, one need not be scared about the possible ill-effects of private or corporate funding. In order to prevent the possible villainous over-play of these private agencies in the Agricultural University system, it is suggested that in respect of proposals received from private
agencies, each University may set up a high power, 'Agricultural Research Policy and Advisory Committee' (ARPAC), with the Secretary, Agriculture of the State as its Chairman and other members representing the concerned Agricultural University, the ICAR, one or two Agricultural Scientists, the State Development departments and farmers.

The primary task of this Committee is to develop procedures relating to research requests of private agencies to be conducted in the Agricultural University. The Committee may have to hold elaborate consultations with the cross section of the Society before formulating the procedures for accepting private research requests.

All research requests of private agencies should necessarily come through this Committee and those that are recommended alone shall be implemented in the University.

At the end of each year, the University should publish a report detailing the private research requests accepted and implemented and also the outcome of such research projects, along with the funds received and spent. Such a publication would provide a system of accountability.

Prosperity of rural India mainly depends upon the quality and the quantity of the manpower and the scientific output that the Indian Agricultural Universities would generate. Towards this end, mobilising more and more funds from all sources, particularly from sources other than the conventional ones is necessary so that the Agricultural University may have considerably more freedom of action, and more than this the public participation in the activities of the University, besides bringing funds, will also bring in public good-will. This goes a long way in sustaining the positive contribution of the Agricultural University to the rural community at large with the participation of the 'Consumers' of its output.
Mobilisation of Financial Resource for Agricultural Education

C. Nanja Reddy and J. V. Venkataram

The over-riding importance of the rural sector and of rural people in the development process is unquestionable. Rural Development was a key theme at the world conference of Agricultural Education and Training which was held in 1970 at Copenhagen. Even as early as 1949 the University Education Commission headed by late Dr. S. Radhakrishnan emphasized the need for "Rural Universities". Later during 1955-60, the Joint Indo-American Teams made a comparative study of the institutions dealing with Agricultural Education and Research in U.S.A. and in India and recommended for the starting of Agricultural Universities as that of Land Grant Colleges of U.S.A. As a result, there are 26 Agricultural Universities in India at present. The establishment of these Universities has been acclaimed as an innovation in institutional development for transforming Indian Agriculture. Consequently, tremendous progress has been achieved in the human resource development which helped in technical breakthrough in Agriculture. However, the people who produce the food and fibre have not improved in their economic status as desired. Hence, the farming business is still not an attractive proposition in the rural milieu. Severe poverty continues its deep roots in rural India and unemployment has been increasing in alarming proportion. Therefore, it is necessary to review the agricultural education and research and make it much more practical-oriented to help in the rural development process. Probably keeping these ideas in view Dr. G. V. K. Rao's Committee recently recommended for the establishment of new compact agricultural colleges in Karnataka.

The present Agricultural Universities are being funded by two important sources namely State Government and Indian.

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Council of Agricultural Research. These two sources are in addition to the internal funds or revenue realised from student fees and Agricultural Research Stations.

A critical examination of the share of different sources clearly reveal that the ICAR share has decreased, while the State Government and internal receipts are slightly increased. Generally the grants both for development and maintenance are found to be inadequate even for the existing Agricultural Universities. Therefore it is imperative to mobilise funds from non-conventional sources, which enable to start new agricultural educational institutions in the rural area for regional development. These agencies, organisations or individuals who derive benefits from the agricultural education, research and extension may be considered as sources for funding agricultural education. The beneficiaries may be motivated to contribute for agricultural education funds in the form of cess, a share in their profits or income, donations and contributions.

Mobilisation of Funds

Following are the alternative sources and methods through which funds could be mobilised for funding agricultural education:

1) Agricultural Education Cess: This cess may be collected through formulating government policy measures from marketing agencies involved in marketing of agricultural products, agro-based processing units like Agro-Industries Corporation, rice mills, sugar factories, oil mills etc. Agricultural Commodity Boards like Coffee, Tea, Coconut, Cardamom, Oilseed etc., must be persuaded to fund the agricultural institutions in the rural areas.

2) Donations from Voluntary Organisation: There are quite a number of agencies concerned with rural development activities at present. They may be motivated to
contribute towards the agricultural education fund, which in turn will be used for bringing about rural development. Some of these agencies are MYRADA, BIRDS, AIRD.

3) Contributions from Agricultural Input Manufacturing Firms: The manufacturing firms connected with fertilizers, plant protection chemicals, animal feeds and medicines may be convinced to set aside a portion of their profits towards agricultural education development. This kind of allocation of fund for research and development is in practice in all the industrial units and the same concept may be made mandatory among the agricultural input manufacturing firms.

4) Donations from the Religious Institutions: In India particularly in Karnataka, there are number of Religious Institutions sponsoring the general and technical education. Discussion with the head of these Religious Institutions may be held to impress upon them, the need and importance of agricultural education and may be motivated for funding the agricultural education in rural areas.

5) Harnessing the existing infrastructural facilities: The existing training centres in agricultural education such as Krishi Vigyana Kendras, Farmers’ Training Institutes, Gramasevak Training Centres have already certain amount of physical and manpower facilities. These institutions may be strengthened to impart formal education in agriculture. This in particular helps to minimise the financial outlay and avoids duplication of institutions.

6) The major and minor Agricultural Research Stations within the set-up of Agricultural Universities may also be better used to get involved in formal agricultural education system. May be it is worthwhile to review the
infrastructural facilities and explore the possibilities of establishing new Agricultural Colleges at the Research Stations.

7) The technical personnel available with the State Department of Agriculture, Horticulture, Animal Husbandry and Veterinary Services, Sericulture, Fisheries and Forestry at the district and or taluk level may be drafted for participating in the formal agricultural education programme at the new agricultural colleges. This is the system that was in practice before the establishment of Agricultural Universities. Indirectly this would involve in less financial expenditure as well as physical facilities.

8) The Directorate of Vocational Education is at present importing job-oriented agricultural education for students at Pre-University level in rural colleges. These colleges should be upgraded to provide higher education in agricultural sciences.
AGRUCULTURAL EDUCATION AT PRE-UNIVERSITY LEVEL
-CURRICULUM DEVELOPMENT

H. S. HANUMANTHAPPA*

Introduction

In agricultural education, as in all other organizations, institutions or societies, the vitality of training institutions depends directly upon the vitality of their administrators and staff. This has serious implications for institutional organization and management. If a training institution has to contribute significantly to the progress of the society and educational system with which it is associated, as well as to student progress, it must engender this vitality and provide a favourable climate for its full and continuous development.

Today the need of the hour for agricultural scientists to do some retrospection of the state of affairs with particular reference to the status of curriculum preparation/development at the pre-university level so that an objective and practical programme of instruction in agricultural education could be made feasible. In this direction, the present paper, is only an effort to initiate meaningful and pragmatic dialogue among the participants to devise feasible ways to include agricultural education as part of the curriculum at pre-university level.

Curriculum development

Curriculum development begins with a thorough analysis of all the factors which may influence the structure and content of the teaching programme to be planned. In any curriculum development exercise, the first question is what

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the functions of the majority of students will be after they complete their training. The answer to this question will depend largely on the types of jobs offered or on the entrance requirements for further training. The second consideration is the entrance requirement for enrolment in teaching programme. Once these two points have been established, curriculum development design may begin.

1. Teaching programmes offered by intermediate level agricultural schools and colleges (in the country) should, in the first place, prepare for immediate employment (either in the public or private sector or self-employment) of the students upon graduation. This does not preclude, for example in agricultural secondary or high schools, the curriculum trying to accommodate the enrolment requirements for further training in higher level colleges or universities. But this aim should be strictly subordinate to that of training for immediate employment. On the other hand, the outstanding students should be able to find opportunities for advanced training, preferably after a year or more of satisfactory field experience.

2. The functions associated with particular jobs are often laid down in job descriptions, as it is done in many cases for example, the job description of a village level agricultural extension worker. Job descriptions should indicate clearly the types of work that students will be required to do on completion of their training, and thus the kind of training needed. They do not, however, always indicate the level of training required. The school/college administrators and their staff must check the accuracy and suitability of job descriptions, and must be fully aware of the work that their students will do and the skills they will require. These administrators should have the opportunity to visit and observe and study the duties of field workers closely and to question them about their needs and requirements and to ascertain the level of training required. Local leaders, farmers
and prominent members of the community should also be consulted for their views on the requirements of the students.

3. A curriculum is to a large extent conditioned by the current occupational functions/job descriptions of existing positions. Curriculum design should be a cooperative effort involving the Principal/Director and the staff with assistance from the State, if need be from the Central Administration and in consultation with the representatives of employing agencies. It is vital for the success of the training programme to involve the main potential employers in the curriculum-planning process at all stages and to make special public relation efforts in order to inform as wide a public as possible about the programme.

4. The quality of student output is largely determined by the quality and motivation of the individual students who are admitted to the institution. A start should be made in the secondary schools and vocational schools from which most students will be drawn. It is while they are at school, possibly during their final year, that they should be given information about the training at agricultural schools and colleges, including entry requirements, training programmes and future employment prospects.

A careful situation analysis in the sense briefly described is the indispensable basis for the construction of a relevant curriculum. There is nothing to be gained from offering training that is unsuited to the local situation and for which there is no demand, students with insufficient or inappropriate skills to match later employment opportunities are not wanted.

Main elements to be included in the curriculum

1. Once the situation analysis has been completed subject-matter coverage and the skills to be taught need to
be identified clearly. This includes those subject areas that are more strictly job-related or of an applied nature (e.g. animal husbandry, plant protection, farm management). It also includes the “Foundation” subjects that provide the scientific base for the applied subjects. Chemistry, physics, biology and mathematics usually belong to this group. Then follows the group of general education and behavioural subjects. These general education courses usually receive more importance in agricultural secondary and high schools than in post-secondary agricultural schools and colleges operating outside the secondary education system.

2. Teaching programmes at agricultural secondary schools operated by ministries of education or other educational authorities tend to emphasise general education subjects over agricultural subjects and contain much material that is useful as a preparation for further education. This large share of general education/behavioural subjects, however, is at the expense of applied subjects.

In contrast, agricultural teaching programmes offered at post-primary and post-secondary level by schools and colleges under the authority of ministries of agriculture or other sectorial ministries usually focus on specific employment opportunities. This should be the recommended focus of intermediate agricultural education. Primary importance should be given to the relevant applied subjects and respective foundation subjects.

3. As soon as the major elements of the new (or modified) curriculum have been determined; the weight to be given to the three groups of subjects (applied, foundation, general) need to be decided. This will depend upon the various factors including the kind and range of job-orientation to be covered, the depth and breadth of foundation knowledge required and the prescribed general education
and/or behavioural subjects to be included. The "optimal" share of teaching time to allot to each for e.g., 40 per cent for applied, 30 per cent for foundation and 30 per cent for general education subjects - must be decided in the light of the teaching objectives to be achieved and an analysis of the local situation.

4. The next step in the curriculum development process is to lay down in detail, the topics to be dealt with under each subject chosen. This exercise is a difficult and time consuming operation and requires the cooperation of the entire teaching staff. Care must be taken to stick to the essential elements, to avoid duplication and to fill gaps that have been detected. Besides, the elaboration of the various topics, the anticipated minimum teaching time required should be established.

Some educators claim that in order to construct a curriculum for a certain type of programme it is advisable to use "model" curricula developed in other countries. This view is not supported because local conditions are decisive in influencing curriculum structure and content. Certainly the people concerned with curriculum development should feel free to study existing curricula but these should be evaluated in the local context. A consultant experienced in developing curricula for agricultural schools and colleges should be invited to visit the institution.

Attempts have been made in recent years to experiment with different types of curriculum structures both at the State and National levels. In one case, the teaching of applied/job-oriented and foundation subjects has been built around the practical work undertaken by the students on the school farm. Another approach tries basically to maintain the structure of the classical arrangement, but includes all the applied content in very few major subject areas, e.g. crop production, animal production and farm management. The aim is to
assist the students to understand agriculture as one inter­
related socio-economic system, rather than as a loose collec­
tion of individual independent subjects. Again, flexibility
and a high degree of staff cooperation are indispensable if the
Teaching is to be illustrated in field situations.

It must be noted that most teaching programmes offered by
agricultural schools and colleges at the present time last for
one or more years. In the students interest and in the interest
of the government/agency financing the training, the training
period should not be longer than essential. If, for example,
the pre-service training of field extension workers can be
completed in two years prolongation of the programme to
three years should be strongly resisted. New subjects and
topics have been added to many existing curricula over the
years, but seldom has obsolete material been deleted. As a
consequence, the curricula of many institution require major
surgery to make them appropriate and relevant.

In the context of new education policy the present system
of pre-university agricultural education needs to be reoriented
to suit and meet the vocational interests of the students as
well as the farming community at large. In order to meet this
challenge, the present system of curriculum development
should be reviewed/revised such that a large community of
young and aspiring and talented youth both in the rural and
urban sectors benefit immensely to meet the challenges of
changing society.
INCREASING THE EFFECTIVENESS OF KRISHI VIGNANA KENDRA (KVK) TO MEET THE DEVELOPMENT NEEDS

G. SOMASHEKARAPPA AND M. MANIMEGALAN*

Considering the need for training skilled workers and middle level technicians in agriculture, Kothari Commission on Education (1964-66) recommended for institution of Agriculture Polytechnics. These polytechnics are of multi-purpose institutions providing a wide range of training in 100 and odd specialised courses. The diploma holders from these polytechnics are supposed to provide supporting services to farmers. However, the idea of agricultural polytechnics underwent a sea change in the hand of the Mohan Sinha Mehta Committee. The Committee renamed the institution as Krishi Vignana Kendra (KVK), limiting scope to impart training to only those extension workers, who are already employed and to the practicing farmers, or who wish to be self-employed. Studying the KVKs in the country, the National Commission on Agriculture observed that the KVKs are beset with wrong choice of trainees, course content and timing of training.

Following are some of the suggestions for increasing the effectiveness of KVKs.

1. Utilize wisdom of villages: Having lived with village situation, the farmers possess basic knowledge about their living condition, soils, crops, local ecological conditions, social institutions and the risks inherent in trying innovations. They have developed keen insight about their own needs and priorities and also means of achieving their goals. They may be resistant or skeptical to change. But, their basic wisdom and qualities must be respected in formulating KVK programmes.

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2. Respect for cultural values and norms: Whether good or bad, villagers have their own beliefs, opinions or attitudes towards innovations. However, the values and norms should form a framework or starting point from which change can take place. Although these effective components are rigid, if the proposed change is demonstrated as culturally and economically viable, one can bring about a breakthrough in the social values and norms.

3. Use of local organisations and leaders: Rural communities are characterised by the existence of social institutions—school, Panchayat, Cooperative, Youth clubs, Women associations etc., and the informal lay leaders. These organisations and leaders provide support and help, legitimize innovations leading to improvements in the living standards. Besides existing local organisation and leadership, new institutions and leadership may have to be created that are acceptable to established leaders.

4. Technology offered must be useful to villagers: Content of training programmes must be useful to the farmers. Technologies selected must be profitable, practical and within the means of the individual or group of farmers.

5. Ensure Government and villagers support and commitment: Most often, State Government might have several development projects for agricultural development. Funds made available for the development programmes are likely to go unutilized due to lack of initiative by the villagers. Therefore, it is essential to ensure support of government and villagers to development. It is imperative that the villagers make commitment of their resources, their energy and their willingness to change.

6. Integrated approach and programmes: Improving the standard of life in rural areas is a complex process and so is the agricultural development. There should be proper coordination
with institutions dealing with credit, health, marketing, family planning, adult education etc. and develop programmes that are mutually beneficial.

7. Selection of appropriate communication methods: Training farmers is not an easy job. Development messages should be informative, persuasive and attuned to the thought forms and cultural patterns of villages. Besides, learning by doing, simple graphic devises and audio-visual aids which supplement oral presentation or discussion may be used in single or in combinations. Use of two or more media in any combination is likely to produce better results than any single medium.

8. Ensure availability of supplies other resources when required: It is evident that farmers training would lead to improved ways of crop and animal husbandry, which require inputs or equipments in varying quantities and time. Failure to get inputs suggested in a training programme do raise questions in the mind of villagers about the credibility of the training institutions. Furthermore, the institution should see supplies, material inputs and market information made available on a sustained basis.

9. Involvement of women: Although stress is on the involvement of women in training programmes, not enough attention is given to the special problems in training rural women. They should be regarded as full partners of agricultural and rural development. The training content and communication methods needs to be evolved to suit their learning needs.

9. Evaluation is essential: Evaluation is an integral part of all the institutional programmes. It is a continuous process in which the trainees are evaluated before training, during the training and after training. There should always be the monitoring of development programmes. It is necessary to select suitable evaluation methods at different stages of training programmes and the results used to improve the training.
Agriculture in India is in a state of transition. In recent years, rapid changes have occurred in the total agricultural complex. As a result of concentrated agricultural research new vistas have been opened for increasing agricultural production in the country. But more creation of knowledge is not a guarantee for sustained agricultural growth.

Farming in India is no more of the old subsistence type but is taking the shape of an industry, on account of the various new inputs recently employed in agriculture, such as chemical fertilizers, hybrid/high yielding quality seeds, insecticides, machinery, improved livestock, fencing etc. Therefore, the farmer in spite of all efforts of training programmes of-ten-times feels helpless to adopt the improved practices. There are absolutely no professional people in rural areas to cater to all needs of farmers. The transfer of technology is not a simple phenomenon, but now it is the monopoly of a simple agency. In this context, it is to be considered that agricultural development programmes are inter-twined with the management of supplies, services, in addition to catering the appropriate technology to different categories of farmers and varied set of enterprises of agricultural vocations. Therefore, the need for different categories of technical people such as traditional professional carpenters, blacksmiths, masons etc. in villages become much more accentuated, now under planned development, since the government is pumping crores of funds for development of agriculture.

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It is no exaggeration to say that this factor of providing the middle level technical persons in rural areas has almost turned to be a limiting factor in the adoption of improved farm practices in full measure. It is also vital to treat agriculture as a primary industry and provide all necessary facilities to individual farmers, instead of general propaganda and formulation of projects. As such the 'Farm Planning Technicians' have got to be trained to take up professional careers. Having provided the said facilities to the farmers in addition to marketing and remunerative prices, I am sure, the real rural development takes place and the proverbial indebtedness and poverty of the farmers would be solved once for all.

After India became free in 1947, many commissions and committees have made a study of Indian Agriculture in depth. Dr. Radhakrishnan's University Education Commission in 1949, and Dr. Kothari's Education Commission in 1966, are the most outstanding and their reports are based on the deliberations of national and international experts. So also, Indo-American terms, one committee set up by the Government of India and widely known as Dr. Cummins Committee, another an Agricultural Study Team of the Administrative Reforms Commission are some of the many high level bodies, which have examined the problems and needs of Indian agriculture. Recently, the National Commission on Agriculture has also made valuable recommendations. One of the most important recommendations running through all these is that, an effective service to Indian Agriculture through an integrated training of technical people and causing them to move to the rural areas, so as to cater to the needs of average farmers.

The Education Commission has recommended the following with reference to the Agricultural Polytechnics. "As in Technical Education for Industry, we believe that there is great scope in India for the training of skilled workers and middle level technicians in agriculture for the supporting services needed
by the farmer, for assisting in extension, for many trades
and industries based on agricultural products and in the
service trades."

The Polytechnics should be multipurpose institutions
providing a wide range of training in specialised courses
related to the above range of skills as they are needed in
animal husbandry, horticulture, processing, forestry, crop
production, farm machinery etc., It should be of a diploma
character demanding up to three years study depending upon
the level of specialisation required these spheres. The Poly-
technics should be attached to Agricultural Universities.
Some craftsmen courses should also be organised for those
who have less than matriculation qualification and certificates
given to them. The curriculum of each centre should be in
accordance with the conditions in the respective regions.
They should be practical in nature and require a significant
period of practical experience. After well establishing, the
polytechnics, may offer short condensed training courses for
young farmers including women and girls. As in other
vocational education, the exceptionally merited student should
get facility for further study. The Courses should be terminal
in character leading to specific employment. Status and
scales of pay of the Diploma, certificate holders should be
given attention. In this connection efforts will be needed
by both private and public employers to ensure that such
careers are made attractive.

It goes without saying that this step to train the middle
level technicians will not only help solve rural unemployment
but also helps in the development of Agro-Industrial Units in
the rural areas. This is an area which has a rich potential
to generate self-employment and also to start small scale
industrial units in the rural areas. In course of time, it would
help to develop self-employed craftsmen on professional lines
as the traditional artisans such as carpenters, blacksmiths,
masons etc., in villages. Anyway, to cater to the emerging needs of the farmers in different areas, it is imperative that different types of professionals with proficiency in handling several kinds of jobs are needed at the village level. The live need could be met by starting of Agricultural Polytechnics attached to Agricultural Universities, both conveniently and economically.
Sri J. P. Sharma, Secretary, Agriculture & Horticulture Dept.
Delivering the Inaugural Address

Dr. S. Ram, Vice-Chancellor,
addressing the Participants at the Inaugural Session
Participants and invitees at the Inaugural Session of the National Seminar.
AGRICULTURAL EDUCATION AT SCHOOLS AND PRE-UNIVERSITY LEVELS

K. SHIVASHANKAR and G. V. HAVANAGI**

Agricultural Education in India can bring about a rapid transformation in the quality of life for our rural population. It is true that there is a growing demand for abolishing illiteracy, providing education at secondary and higher secondary levels and catching up with advanced countries in higher studies. There is equally an urgent necessity to broad-base our agricultural education system and give it a new thrust so that it receives adequate attention in the main stream of education. Agricultural Education in India is a vital issue requiring a national debate as agriculture is the livelihood and way of life for over 70 per cent of our population. Should the country rest on a sound economy and make strident progress in all spheres then its agriculture be strong which can only be developed, built and sustained with a firm foundation in agricultural education. This solid foundation being absent the present discussion has therefore to be focussed on shortcomings and suggested remedial measures.

The felt needs and aspirations of rural people can only be fulfilled if we take up the urgent task of restructuring agricultural education all over the country at all stages initiating it at the school level itself. This is the time to strengthen the physical and other infrastructural facilities and also to reorient the course curricula. In doing so, agricultural education should be geared up so that the refined, cultured and educated youth coming out of schools and

*Paper based on articles contributed to the seminar.
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colleges have gathered adequate knowledge and skill to be either self-employed in agriculture and agricultural-based industries or to be absorbed in suitable jobs. This goal of agricultural education is well within the principle that growth and development of all education is to be tied up with employment and work.

That agricultural education should be given adequate importance at the pre-degree and schools is generally an accepted view. It is endorsed by several education commissions and is emphasized by the National Commission on Agriculture. The National Policy on Education, 1986 spells out the requirements of reaching the masses, strengthening the infrastructures in schools and vocationalisation at higher secondary levels. There have been various suggestions for restructuring agricultural education. One view is to introduce education on farm life, crops, soils, etc., as part of curriculum in I to IV standards and to introduce agriculture as a compulsory subject from V to VII standards by dividing the courses on general science into (i) General Science and (ii) Agriculture and continue the subject thereafter. For the XI and XII standards, agriculture be taught as a special subject.

The second suggestion is to include the concept of vocationalisation in agriculture education from 1 to 12 standards with work experience, home projects and regular courses. Three types of courses are suggested. They are drop-out programmes for self-employment; regular programme in agriculture with home projects and programme for young and adult farmers. Special vocational courses are suggested to be set up at National Institutes such as CFTRI and CSRI, Agro-industry Agencies such as poultry feed livestock feed plants, fertilizer mixing and plant protection industries etc.

Vocational Agricultural Programme needs rapid expansion extending from middle to higher secondary schools in rural areas. The non-farm jobs also require knowledge and skill
in agriculture and our future farmers should also operate as technicians in their own vocational field. It has been emphasized that agricultural education in schools should thrust upon skill development of the pupils along with other objects. Intrinsic elements of motivation such as approval, recognition and satisfaction which contribute to creativity of youth should find place in the curriculum. The school projects, group projects and individual project should be fit in the curriculum.

These views have to be weighed carefully as to when to initiate agricultural education and what should be the course curriculum. The existing situation with regard to infrastructural facilities available for general education at our primary and secondary schools are by no means commendable. With over 5 lakh primary schools and 1.23 lakh middle schools, the physical facilities like school buildings, black boards, libraries and laboratories are inadequate. Nearly 42 per cent of primary schools in India do not have black boards, 72 per cent no libraries and 54 per cent no playgrounds. Should we expect Agricultural courses mainly imparting practical skills and knowledge to be taught in these primary schools or even in middle schools with such poor facilities? Even if facilities are improved, do we have the requisite man-power to cater to this need of teaching lower level schools? When an overall situation of student enrolment to the number of teachers is examined, it is seen that during 1983, there were 140 lakh students, a 20-fold increase compared to 1947 level. The number of teachers rose from 9300 to 9,93,000, a 10-fold increase only during the same period. The quality and purpose of such early introduction of practical agriculture thus seems inadvisable. Considering a high drop-out and failure per cent at these initial stages, it would be a big waste of resources also. It is therefore suggested that a few well organised lessons are built into some of the subjects in the 5th and 6th standards. It is only in the 7th and 8th standards that a complete subject on
agriculture be introduced. In the 9th and 10th standards, besides one course in general agriculture, any one of the courses can be taken up as optional/special subject. Such a gradual introduction would be strengthening the cause of agricultural education providing a foundation as well as a link for further studies leading to a Diploma or Degree. The present malady in the sphere of agricultural education seems to be a lack of sound courses in school curriculum, an unattractive middle order of vocational courses which is not serving the right purpose and a much needed revision of course content in higher studies besides a lack of linkage between these three levels of learning. The Agricultural Schools in most cases have not been able to infuse confidence in young farmers and agricultural courses offered by some schools at the IX and X standards do not attract students. The pre degree courses in agriculture are meagre and are not giving any foot-hold to the students either to go to their own farms or to gain enough knowledge as a foundation for degree courses in agricultural sciences. The 112 vocational courses suggested by Government of India to be introduced in Junior Colleges are inadequate with regard to agricultural education. The 23 Agricultural Universities and some Agricultural Institutes and faculties take care of higher learning only with a turn over of about 6000 graduates per year. The Agricultural Education system as obtained in the country thus is inadequate to meet the requirements and does not offer any link from school level to degree level. Four pertinent questions raised by the authors in this regard are: (1) Are these Agricultural Universities, Pre-degree Colleges, Multipurpose schools, Vocational Institutes and Training Centres enough to cater to the diversified challenging needs of promoting agriculture to the desired extent? (2) Do they really interact with the felt needs of farming communities and raise the rural population above the poverty line and make them reap the benefits of agricultural education? (3) Are our efforts of educating rural and other people in agriculture equivalent to
educating people in other spheres? and (4) Are all agricultural education programmes integrated meaningfully from school level to post-graduate levels? and what should be the curricula for agriculture and other allied sciences particularly at schools, pre-degree colleges and in vocational institutes?

With an expected 700 million on the farms and in rural-oriented livelihoods by 2000 A.D., there is an urgent need to put in more funds, infrastructural facilities and being in intermediate technological agricultural education to the doors of the farmers. A suggested scheme for imparting agricultural education is presented.

<table>
<thead>
<tr>
<th>Levels</th>
<th>Standards</th>
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<tbody>
<tr>
<td>1. 5th, 6th Std.</td>
<td>Lessons in history of agriculture, crops, classification, crop geography, agril. commodities, uses.</td>
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<tr>
<td>2. 7th, 8th Std.</td>
<td>Separate compulsory subjects in agriculture including soils, crops, horticulture, dairying, fisheries. Syllabus akin to courses in Agril. Schools currently being offered by Karnataka State, Dept. of Agriculture which may be strengthened and merged into general education stream.</td>
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<tr>
<td>3. 9th, 10th Std.</td>
<td>Besides one subject in general agriculture being compulsory, any one of the courses in Agril. Sciences be taken as special optional subjects.</td>
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<td>4a.</td>
<td>Agril. Polytechnics of 2 years duration at one Polytechnic for every</td>
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district. The currently run vocational courses have to be transferred to these Polytechnics where land, laboratory and teaching infrastructures have to be created so as to provide both theoretical and practical experience to students desiring to get settled on farms.

4b. 11th, 12th Std. or P.U.C. Besides one compulsory course in agriculture, one out of the four specialised groups should be agriculture and allied subjects. Those desiring to prosecute degree programmes in agriculture, horticulture etc. should have taken this group.

5. 4 years Degree programme in:

- B. Sc (Agri)
- B. Sc (Hort)
- B. Sc (Seed Tech.)
- B. Sc (Ag. Mark. & Coop.)
- B. Sc (Dairy Tech.)
- B. Sc (Sericulture)
- B. H. Sc.
- B. F. Sc.
- B. V. Sc.

Syllabi in each case have to be reoriented by deleting several topics in basics and applied aspects covered earlier and by incorporating advanced courses and topics.

6. P.G. course leading to M. Sc (Agri.) and equivalents.

To be thoroughly restructural to avoid duplication of courses and research.

7. Doctoral courses

8. Post-doctoral courses

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This scheme offers right emphasis to agricultural sciences in general education. The acceptance of a common structure of education throughout the country of 10 + 2 + 3 system is helpful in restructuring agricultural education also. For the degree courses in agriculture, the structure would be 10 + 2 + 4, with doors open for Agricultural Diploma holders to pursue for degrees also. In this approach, the students can discontinue even at the end of 8th standard, 10th standard or 12th standard or opt for a Diploma in Agricultural Polytechnics. If some 40 per cent of students learning the 10th standard go for these Diplomas, thousands of well trained teachers are required. Even at the colleges and Universities, if agriculture is given prime importance, the man-power requirement in agriculture sharply raises. This is desirable as rural areas account for 70 per cent of population but get less by way of resources for educating them. Although 3 per cent of GNP is spent for education with a budget allocation of over Rs. 5,000 crores per year next only to defence, the break up of expenditure indicates that most of it (85%) required for meeting the salary and salaries administration. No wonder the real physical and instructional facilities in majority of institutions, as if a primary school or an advanced centre are meagre and fall short of requirements significantly. This debate on agricultural education should therefore throw more light on our deficiencies at schools and per degree levels and offer positive approaches to strengthen agricultural education thus paving way for a better life for millions of our rural population.
ROLE OF AGRICULTURAL POLYTECHNICS

M. K. SETHU RAO*

The Education Commission (1966) has pointed out that vocationalisation of secondary education together with post-graduate education and research education for agriculture have to be regarded as national priorities. When this Commission has stressed that "Agricultural Polytechnics at post-matriculation level should be organised on priority basis", there is no need for us to look for other avenues of vocationalisation.

The role of an agricultural polytechnic could be viewed in different angles, as indicated by many of the papers contributed to this session.

- Establishment of agricultural polytechnics would catalyse the change in attitude towards the profession of agriculture among the youth, particularly the educated, thereby improving the prestige of that profession by showing the scope of gainful employment for skilled workers in various spheres of agriculture and allied sectors.

- Agricultural polytechnics would be able to impart vocational education to the youth, to increase their knowledge and skills on various aspects of agriculture and allied aspects so that the human resource potential could be made more viable in productive lines and the unemployment problem among the youth could be solved to a great extent.

- The emerging demands of middle level technicians in agriculture and allied fields for supporting services to farmers, for various change agencies and agro-based indus-

* Paper based on the articles contributed for the seminar
* Director of Extension. University of Agricultural Sciences, Bangalore.
trial units can be met with the trained manpower from the agricultural polytechnics.

— These nodal institutions can help to improve the knowledge and skill of practising farmers, farm women and youth to enhance their managerial efficiency for increasing output and life situation.

**Functional approaches of agricultural polytechnics**

Various approaches have been envisaged for the functioning of agricultural polytechnics by the reports of Education Commission as well as the National Commission on Agriculture. When the agricultural polytechnics come to existence with its multitude of training strategies, the present training institutions like Rural Development Training Centres, Farmers Training Centres, Agricultural Schools etc., can be amalgamated with the new institutional framework. This would help to make use of the existing infrastructure and other resources for the establishment of agricultural polytechnics, at least one in each district, as suggested by various contributors of this seminar. It would be ideal for the agricultural polytechnic to function under the Agricultural University to maintain standards in technical competence and available facilities. A team of qualified teachers, well equipped laboratories, small processing plants and workshops and necessary opportunities for practical exposure and experience are also essential for meaningful functioning of an agricultural polytechnic.

As the agricultural polytechnic is supposed to strengthen the technical competency of manpower related to the farming situation, of the locality it serves, it would be better to attach it to the nearest Regional Agricultural Research Station for additional facilities. There is also a suggestion to convert the
Krishi Vigyan Kendras to Agricultural Polytechnics in the beginning and extend this institutional network to all districts in a phased manner

Training strategies

Essentially the courses offered at the agricultural polytechnics may be mostly non-formal in nature generating farm managers, farm mechanics, craftsmen and technicians in agriculture and allied sectors. The course contents, duration and intake for each course may vary depending upon the objective of the course and demands of the locality. The agricultural polytechnic, being a nodal training institution to serve the rural development, shall have a variety of course programmes of different durations. In addition to the vocational education, it should provide training to generate middle level personnel of development departments and organisations like cooperative banks, fertilizer firms, seed industries etc.

The participants may be drawn from various target groups based on the needs of the programme. As the course contents extend to different aspects of rural life such as crop husbandry, animal husbandry, fisheries, sericulture, forestry, home science etc., a proper co-ordination with institutions dealing with credit, health, marketing, family planning etc. is also warranted.

When the courses are directed to satisfy the lower level manpower needs of various development organisations, the duration may extend up to three years leading to a diploma or certificate in the concerned subject. The areas of instruction for such courses may include crop husbandry, animal husbandry, dairy technology, fisheries, poultry science, sericulture, farm power and machinery, soil and water management, processing technology, home economics etc. The vocational training programmes can be of varied duration based on the topic and the need of the target group. Such
Courses may include the topics such as seed material production, repair of farm equipment, essential oil extraction, project planning and budgeting, animal health care, processing technology, bakery training, training of village crafts, plant protection etc. or even any minor specific skill which would help them to find gainful self employment. Practicing farmers, farm women and farm youth can also be the beneficiaries of some short term courses so that their managerial efficiency would be improved for better styles of life.

All the papers for this session have unequivocally stressed the need for onfarm training for improved skills under any course programme of the agricultural polytechnic, which demands all necessary facilities. The manpower trained in this institution would serve various development organisations, self-employment schemes and better styles of daily life. Such a micro-level, multi-disciplinary model institution would serve the recommendations and options suggested by various expert committees including the G.V.K Rao's Committee on Agricultural Education, and its implementation might satisfy the training and skill development needs of our rural life.
RURALISATION OF HIGHER EDUCATION IN AGRICULTURE

R. RAMANNA**

Agriculture is the predominant occupation of India with over 2/3rd of the population depending on it. According to 1985-86 estimate, over 30 per cent of the national income is derived from this source and about 66 per cent of the workers are engaged in this profession as cultivators and agricultural labourers. Despite this importance of agriculture to our national economy and the richness of the natural resources agriculture is singularly backward and its productivity is nowhere comparable to any of the developed countries of the world. This state of affairs is largely attributed to the backwardness of the human resources. Prof. Taylor aptly remarks that many rural communities have remained poor in the midst of their rich surroundings merely because human resource was of poor quality. In the context of improving the productivity of agriculture in India it is essential that quality of the human resources that is engaged in harnessing the resources in rural areas is improved. This brings to the fore the need for spread of agricultural education of the right kind in the rural areas to put to most productive use the resources in the rural communities. Thus agricultural education can be viewed as a means of achieving the goal of agricultural development in the country.

The national debate on how to reconstruct and reorient the educational system of the country to make it more relevant to the developmental needs has been initiated. The document “Challenge of Education: A policy perspective”, brought out

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* Paper based on the articles contributed to the seminar.
** Dean, University of Agricultural Sciences, Bangalore.
by the Ministry of Education, Government of India in August, 1985 has focussed on reduction of inequality of educational opportunities, relevance of education to the country's development needs and expectations, utilization of the existing educational infrastructure and improvement of the quality of education, modernisation and strengthening of the content of science and technology in education, and the creation of a national system of education.

Establishment of Agricultural Universities in India in 1950's, patterned after the Land Grant College Model of the U.S.A., has been acclaimed as an innovation in institutional development for transforming Indian agriculture. These agricultural universities are expected to direct and sustain their major efforts towards bringing the full force of science and technology to bear on the problems of rural areas. The programme of education for agriculture is based on three main elements - development of the appropriate technology to practising farmers, extension and training of the needed personnel through teaching. Philosophy of service and dedication to the rural folk is the guiding principle of this Model. It is declared that practical utility, not snobbish academic responsibility nor any notion of intellectual aristocracy, must be the signpost to direct the activities of these Universities. These Universities are supposed to have concerns for:

- all aspects of increasing, disseminating and applying knowledge related to agriculture
- teaching and research directly and immediately related to the solution of the social and economic problems of the rural areas
- readiness to develop and teach the wide range of applied sciences and technologies needed to build up the rural economy
- readiness to teach not only regularly enrolled students, but also to give specialised technical training to young people who are not candidates for degrees.

There is ample evidence to indicate that the Agricultural Universities in India since their establishment in 1960's have been the major partners in the development and spread of new science-based agricultural technology among the farmers and initiate the process of transforming traditional agriculture.

Despite this positive role of the Agricultural Universities in the country, it is time now to review to what extent their role performance has matched with role expectations.

An introspection of how we have steered the path of agricultural education would help this kind of appraisal. The Education Commission (1949) headed by Dr. S. Radhakrishnan, while promoting the idea of Rural Universities recommended that education should be given in rural setting by establishing Rural Universities. Clearly then, the environment of Agricultural University should not be the same as other universities which are urban-centred. This kind of urban environment which is dominant in our campuses seems to have promoted urban-based agricultural education with urban-oriented faculty and students. Agricultural education has become a passport for personal advancement of agricultural graduates for urban-based white-collar jobs. This is evidenced by the fact that only a negligible proportion of these graduates have settled on land. Besides, many research pursuits are likely to be designed in such a way that it would promote the personal advancement of the research without much tangible benefit to the rural areas.

Thus, agricultural education in our country is confronted with problems of deviation from its major goal of serving the cause of the rural people. Hannah, one of the leading
agricultural educationists remarks: "The purpose of an effective institution of higher education in agriculture is to educate for service, experiment to solve real problems, conduct extension work to learn about problems and consummate solutions, and engage in public service so the leadership in agriculture will learn to respect it and look to it for guidance and help".

In an attempt to reconstruct and reorient agricultural education one of the major recommendations of the Education Commission (1949) should be kept in view. The Commission remarked:" The crowding together of thousands of undergraduates, as in the case of some existing universities, is highly undesirable. A way should be found to combine the advantages of small resident, undergraduate colleges where there are close relations between teachers and students, with advantages of fully developed universities which offer a wide range of specialised and advanced educational opportunities to advanced students or to other students, with specialised interests".

Since many of our Agricultural Universities lack the atmosphere so essential for imparting quality education at the undergraduate level, establishment of smaller colleges at regional levels, perhaps at the Tahsil level, one for each district would meet the requirement. This may in the long run go towards our aim at achieving dispersal or decentralisation or ruralisation of agricultural education in the country. The concept of decentralisation of research, however, has been achieved in some good measure by the establishment of regional research stations under the National Agricultural Research Project funded by the World Bank. As a beginning these regional research stations could be considered for establishing smaller agricultural colleges availing the buildings, staff and other facilities at these stations with minimal additional expenditure. Hungary, for example, with a population of about 10.5 million has three Agricultural Universities
besides one for Horticulture, one for Veterinary and one for Forestry offering five-year degree programmes to students with 12 years of general schooling.

Dispersal of agricultural education besides, meeting the specific requirements of agricultural development and training graduates in rural setting has many other merits. Concentration of thousands of undergraduate students at one central campus has resulted in what is termed as campus explosion with its attendant draw-backs. It is a well-known fact that the political potential of the student body at a large university in a capital city exceeds that of students enrolled in Colleges in more isolated areas. In the capital, the students’ proximity to Government and opposition, easy access to political information and communication media all tend to facilitate the task of the activist.

Eventhough we claim a low student-teacher ratio in most of our agricultural universities, this claim is only in theory than in practice as the class-rooms are overcrowded with 80 or more students in each class virtually amounting to teacher lecturing the anonymous crowds and the benefits of the professed trimester/semester system of education is virtually lost.

Another merit of the dispersal of agricultural education in rural areas is the closeness of the parents to their wards who can exercise a more closer and better control over their children and watch their academic progress. The parents have better opportunities to visit the campus, enquire about the progress of their wards and this will help to maintain discipline, peace and harmony on the campus and thus create better teaching-learning environment.

As has been pointed out earlier, a beginning in the ruralisation of higher agricultural education can be made by establishing agricultural degree programmes at the regional
agricultural research stations where most of the infrastructure for establishing the degree colleges already exists. The benefits of establishing such regional colleges far exceed the additional expenditure required and hence this policy of regionalisation/ruralisation of agricultural education should be vigorously pursued. Besides, some of the additional funds for this programme could be raised from within the locality. Japan, for example, although a small country, is already in the forefront in implementing this kind of regional approach in agricultural research, teaching and development. The Regional Agricultural Experiment Stations in Japan have been transformed into Regional Agricultural Institutes which carry out all the three functions of agricultural research, education and extension, although agricultural universities have not been set up in that country. In these Regional Agricultural Institutes of Japan, only about 50 per cent of the budget is spent for research, while the remaining portion is devoted for student teaching and for providing services to farmers.

In respect of stations where adequate infrastructural facilities are not available for starting degree programmes in agriculture, short diploma courses in agricultural sciences of one year duration or adhoc training programmes of 3-6 months duration for farmers or farmers sons could be started and gradually degree programme could be taken up. Thus these regional agricultural stations, besides their normal function of research, would be involved in teaching and extension activities and the ideal of establishing agricultural universities viz., integration of the treble functions of teaching, research and public service could be achieved. Teaching and research would be more purposeful through such integration as there is a continuous feedback of the field problems. Possibilities of funding for these regional institutes at least in part by the direct beneficiaries of agricultural education, research and extension such as farmers, agro-based industries, agricultural marketing institutions, command area development authorities and other corporations should be explored.
PRACTICAL CONTENT FOR INDUCTING WORK EXPERIENCE IN AGRICULTURAL EDUCATION

K. M. JAYARAMAIAH**

The premise

The New Education Policy (1986) envisages work experience as an essential component of all stages of education, to be provided through well structured and graded programme. By gainful work experience in the application of farm technology, the students would be well equipped to pursue farming as a profession or to serve as change agents in any development programme. Hence, the practical component in agricultural education, which provides opportunities for more work experience is very important and essential.

The Committee of Deans on Agricultural Universities (1985) recommended that the practical training in the professional curricula of UG programme should include:

Practicals in each subject designed to illustrate concepts, and to make the students learn specific skills and methodology related to course content.

Production-oriented field training as a part of the curriculum to enable the students to operate projects of production.

Experience of work with farmers in villages to enable the students to know the problems encountered by the farmers in adopting recommended practices and to learn the skills of effective transfer of technology.

*Paper based on the articles contributed to the Seminar
**Professor and Head, Department of Agricultural Extension, U.A.S. Bangalore.
Internship to enable the students to learn certain skills from experienced specialists working in actual work situations.

In the light of these recommendations and the suggestions made by the contributors of various papers for organising effective practicals/work experience to the students, some issues are raised and suggestions made in this paper for discussion and decision.

Issues and suggestions

1. Practicals

Most of the courses offered in the university carry practicals to correlate theory with practical application. The ratio of theory to practicals ranges from 3:1 to 1.2:1 depending on the type of degree programme like B. Sc. (Agri), B. V. Sc., B. Sc. (Fishery) and so on. Of course, the induction of more practical content into agricultural education perhaps provide for better work experience. But, the extent to which the practicals can be included into the curricula depends on the nature of subject matter, the availability of lab. facilities/transport facilities and so on so forth. It is especially so in social sciences where the transport facilities are a must to organise and make the practicals more effective and purposeful.

2. Production-oriented field training

2.1 To teach the concept of dignity of labour and to impart field-based practical training, the G. B. Pant University of Agriculture and Technology has been offering a course titled 'Practical Crop Production (PCP)' to the final year B. Sc. (Agri.) students. It carries 4 credit hours spread over two semesters. For every team of eight students, one hectare of land is allotted and the inputs are provided out
of a revolving fund. Grading is done based on operations completed and the yield levels obtained. The profit earned by the students by this project had gone up to an extent of Rs. 7,500/year. Of course, all other agricultural universities can undertake this course ‘PCP’ provided there are facilities for irrigation and a responsible team of teachers, to guide the students.

2.2 ‘Earn while you Learn’ programmes have to be promoted to help the students to acquire some skills and to earn some money. These should be production-oriented projects organised under the guidance of a Monitoring Cell or the self-chosen projects of the students themselves. These projects may be, crop production projects or the enterprises like sericulture, bee-keeping, kitchen gardening and such others. The inputs have to be provided by the University on loan basis and the cost of the same recovered after the sale of the produce. The Deans Committee too had recommended for organising such projects outside the curricular requirement. But, as it is not a course requirement, the University may not organise such programmes at all. So, at the present juncture there is a need to push such programmes to help at least the students of weaker sections by designating a few dedicated teachers to work on such projects.

2.3 The degree in agriculture has to be need-oriented to produce professionals who are fit, to take up agriculture as an enterprise. In this direction, the course like the ‘crop production’ (upto 6 credits) that is being offered in the University of Agril. Sciences, Bangalore has to be offered in other universities also to provide enough work experience to the students to pursue agriculture as a profession.

3. Experience of work with the farmers in villages

3.1 The Rural Agricultural Work Experience Project (RAWEP) is an internship programme, offered to final year
Y. G. students in order to provide rural-oriented work experience and to motivate graduates to engage in self-employment. It is an internship of one semester carrying 18 credits. Here, the students are expected to be located in villages around college campus/Regional Research Centres. Now, this type of programme is already in vogue in APAU for final year B Sc. (Agri.)/B.Sc. (Hort.) students with 18 credits semester load; this pattern has been adopted by the Agricultural Universities in Maharashtra State too. The Committee of Dean's has recommended for the inclusion of this project in the curriculum of various degree programmes, and this need to be explored by the other Agricultural Universities.

3.2 The Deans Committee has recommended to entrust the work of supervision of such a project to staff members with extension experience; and evaluation to extension specialists of State Agriculture Department. But, the APAU has entrusted the work of planning and evaluation of such projects to the Advisory Committees. A stipend of Rs. 250 per month is being paid to the students and this system is said to be working well. So, it is advisable to retain the role of Monitoring and Evaluation with the Universities themselves. However, the ICAR can be approached to pay stipend and provide model technical programme.

3.3 It is necessary to attach two to four students to a village and each student to work with a family, participating in all agricultural activities. But since this RAWEP programme has to be organised around Research Stations every year, the need for putting more number of students in each village needs consideration. 15 students per village may be ideal to accommodate a batch of about 150 in 10 villages.
4.0 Village stay practicals

4.1 In order to provide opportunities to the students to practice the use of various extension methods; to help understand the problems that inhibit agricultural development and to study the ongoing development programmes, practical extension work in villages (Village stay practicals), have to be organised for final year students of all degree programmes by the Department of Agricultural Extension. The course may carry 3 to 5 credit hours depending upon the type of degree programme. This programme is very popular in the University of Agricultural Sciences, Bangalore and can be emulated by other universities.

4.2 The actual stay of the students in villages should preferably be for three weeks during the trimester irrespective of the degree programme. But this has to be decided based on the practical credits the course carry; it may be for 2 to 3 weeks.

4.3 The staff of NAEP should be utilised for organising village stay practicals by reaching a memorandum of understanding with the Department of Agriculture. However, the course teacher may have to provide guidance to the students through visits once in 4 to 5 days. Further, upto 50 per cent of the total marks have to be allocated for practical work in order to promote better participation of students in field work and extension activities in the villages.

5. Internship/placement

The National Commission on Agriculture (1976) has recommended for the organisation of placement services to provide a link between the graduates and their prospective employers.

In this direction the UAS, Bangalore has been organising several programmes to the students at UG level.
5.1 Placement training for final B.Sc. (Ser.) students is being organised for 12 weeks, carrying 12 credits hours. The students are placed at filatures, silk farms and grainages, and a stipend of Rs. 10 per day is given to each student.

5.2 The placement training for final B.Sc. (Agri. Mark & Co-op.) is for a duration of one trimester carrying 12 credits. The training institutions being Co-operative Societies, Banks, Processing and Marketing Units. A stipend of Rs. 10 per day is being paid for each student.

5.3 The Internship for final year B.V.Sc. is organised for two trimesters carrying 9 credits in each trimester. The students are put to work in State and University owned live-stock farms and hospitals and each student is paid Rs. 400 per month as allowances and Rs. 200 as T.A. for the entire period of internship.

5.4 Inplant training for final B.Sc. (Dt) students is organised for two trimesters, carrying 4 credits each. The students are drafted to work in different State/Central Govt. Dairies; a stipend of Rs. 300 per month is awarded to each student.

The evaluation and grading of internship / placement programme is done mostly by the University staff in-charge of course in consultation with the staff of the host institutions.

Now, it is necessary to take a decision whether to conduct these programmes on similar lines or to incorporate certain modifications to provide better work experience to the students.

6. P. G. Diploma

The University of Agricultural Sciences, Bangalore, has been organising P. G. Diploma Courses in intensive crop
production for a period of one year for B.Sc. (Agri.)/B.Sc. (Hort.) graduates at Research Stations. They are allocated five acres of land to raise crops and nurseries; the inputs are provided by the University and the cost recovered after the sale of produce. A stipend of Rs. 200 p.m. is given to the residential graduate farmer. This course is said to provide enough opportunities to the graduates to learn the skills in modern agriculture through field experience, which in turn help the graduates willing to pursue farming as a profession at a later date.

Such programmes need to be encouraged by different Universities in the country.

Conclusion

There is a need for inducting adequate practical training into the curriculum at U.G. level in agricultural universities, to enable graduates to handle with confidence the practical problems encountered in farming. How exactly it has to be done is left to the intellectual judgement of the teaching community.
DISTANCE EDUCATION

M. B. CHANNEGOWDA

This lead paper is mainly based on the 21 papers contributed by different authors spread all over India.

The issues for discussion in this seminar are: (1) Distance education for those who cannot attend the educational programmes at the University centres and (2) short term specialised correspondence courses for those who have already had higher agricultural education—provide opportunities for them to learn and make learning a life-long activity. How the Agricultural Universities could go about in operationalising these ideas?

1.0. Genesis and coverage

1.1. The concept of open university in India originally emerged from the need for wide provision of adult education (a post-war trend) which was facilitated by the growth of mass media especially the radio and television. Distance education was given a concrete shape in 1962 with the introduction of correspondence education as a pilot project in the University of Delhi. By 1985, 29 Universities for students of various degree courses have introduced correspondence education in India. In order to give a spur to distant education, the Government of India has set up the Indira Gandhi National Open University.

1.2. Of the 25, Agricultural Universities in India, the Punjab Agricultural University, Ludhiana has designed a correspondence course for 250 literate Punjabis farmers on
integrated agriculture during 1971. By 1985, six agricultural universities spread over, Punjab, Uttar Pradesh, Madhya Pradesh, Gujarat, Tamil Nadu and Karnataka have conducted correspondence courses for farmers and farm women. The duration of courses range from three months to eight months covering wide range of subjects such as crop husbandry, soil and water management, insecticides, fodder, sericulture, floriculture, animal husbandry, poultry, fish culture, agricultural economics and agricultural engineering. The eligibility for admission is reading and writing in Hindi (Madhya Pradesh, Uttar Pradesh), knowledge of Tamil (Tamil Nadu), pass in VII standard in Kannada (Karnataka), Matriculation in Punjabi language with relaxation in some cases (Punjab). Contact centres were identified and used in Punjab (twice a year) and in Tamil Nadu. The available reports indicate that in Punjab, 9576 rural people (5724 general farmers, 1449 small farmers and 2403 farm women) and 437 farmers in Karnataka derived the benefit of correspondence.

2.0 What is Distance Education?

2.1. Distance education is one of the various forms of study which are not under the continuous, immediate supervision of tutors, present with their students in lecture rooms and that it includes all those teaching methods in which teaching is conducted through print, mechanical and electronic devices.

2.2. The distance education consists of two aspects (1) production of course materials and (2) delivery or proliferation of such instructional material. Perhaps he has focussed on correspondence course.

The system is open (not closed), learning is problem-oriented, the time and pace of learning depends on learner. Distance education includes two aspects (1) distance teaching
and (2) distance learning. It is impersonal with no direct feed-back to the teacher.

3.0 Why Distance Education?

Persons in rural India cannot avail facilities of formal education because of the following reasons:

1. Majority of farmers are economically poor.

2. Difficult to provide institutions for formal education within the easy reach of those who want it.

3. Farmers residing in remote areas on hills and in forest regions do not have access to formal educational centres.


5. High level of illiteracy in rural areas. According to 1981 Census, the percentage of literacy in rural areas is 29.6 while it is 57.4 in urban areas. Between the male and female literacy in rural areas it is 40.8 percent among males and 18.0 percent among females. Even though there is an increase in the percentage of literacy from one year to another, there is increasing number of illiterate farmers.


7. Reluctance on the part of the children and illiterate adults living in remote villages in poor socio-economic conditions to attend schools even when they are available.

8. The ratio between the extension worker and the farmers is very high.


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10. Educational television programmes are not available in all parts of the rural areas, even where they are available, most of them are syllabus-oriented.

11. The graduates of agricultural colleges lack practical experience to work as professional agriculturists and lack self-confidence, practical approach thereby contribute very little.

12. Very few freeships and little financial inducements are available for students.

4.1 Advantages of Distance Education

In the Indian context the distance education has the following advantages:

1. It is possible to make a course relevant and thus integrate it within the socio-economic and cultural ethos of Indian society.

2. It is free from the rigidity of age, time, geographical isolation (space), pace and captivity.

3. It is low cost if adopted on a large scale.

4. It helps in equalizing opportunities of education for the neglected sections of society.

5. It reaches mass of people at their door step situated in wide geographical rural areas without imposing restrictions.

6. It can reach both literate farmers and illiterate farmers.

7. The system of teaching by correspondence material, television and radio will be open to the public for criticism and suggestions for improvement.
8. Distance education through correspondence lessons, contact centres, radio, television, satellite and audio-visual programmes require technical man-power at the University and at Regional Centres. Implementation of these programmes would generate tremendous potentialities to agricultural graduates, engineers, social workers, health workers, technicians and other allied trained personnel.

9. It helps to achieve national integration.

4.2 Disadvantages of Distance Education

1. Absence of provision for immediate feedback.

2. Distance education cannot give practical training in complicated skills associated with professional and technical courses. As such, only courses preparing 'generalists' can be planned.

3. Keeping up the time schedule for a vast number of candidates or to provide for a very flexible scheduling of time will cause immense organizational problems which demand money and efforts.

Issues for discussion

1. A new Department of Distance Education in every Agricultural University in India will have to be created to strengthen/initiate and strengthen distance education.

2. Research and continuous feedback for dynamic distant education is identified as essential. Therefore, the new Department of Distance Education shall have this component also.

3. There is a need for Distance Education Committee, involving the representatives from the Development Departments, Statutory Organizations, Zilla Parishat and Voluntary Organizations, in the Agricultural University.
4. A strategy for distance teaching specifically to the following situations may be developed:

   a) Irrigated areas
   b) Rainfed areas
   c) Hilly areas
   d) Forest areas
   e) Small farmers and marginal farmers
   f) Agricultural labourers
   g) Agricultural seasons
   h) Geographical region.

5. Personal contact programmes in correspondence course(s) are essential to teach skills and why of complicated technologies. How frequently, the contact sessions are to be organised and at which centres?
SELF-EMPLOYMENT OF AGRICULTURAL GRADUATES

S. BISALIAH

The theme

One of the major lessons of development experience since 1950s is that there is an impending employment crisis in India in the wake of the more familiar population explosion. Quite simply we do not know yet how to provide enough productive jobs for growing labour force. There is already an enormous waste of human resources implied by open unemployment and by people occupying their time in jobs with very small output. This is much more so in agricultural sector which has represented all along a kind of residual storage tank in which the bulk of the labour force could find some sort of subsistence. The widespread unemployment among the educated youth of the country has led to the argument that educational institution produce unemployable young men and women. Keeping all these in view, it is suggested that self-employment of agricultural graduates is desirable from the societal as well as individual points of view. In this regard, there are certain pertinent issues which could form the frame of theme for discussions.

What is the postulated rationale for promoting self-employment of agricultural graduates? Which are the potential self-employment avenues for these graduates? What constraints operate on their entry into self-employment instead of wage employment? What behavioural attributes could make them self-employment prone? Are there aspects/technologies orientation in which would motivate them to

*Paper based on the articles contributed for discussion
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settle for self-employment? What kinds of development assistance would act as catalysts in steering these agricultural graduates to take the route of self-employment for their career?

The rationale

In fact, self-employment has been the lofty ambition of agricultural education for decades. It is postulated that the entry of agricultural graduates into self-employment avenue would give rise to some tangible and intangible benefits.

—The settlement of duly educated professional youths like agricultural graduates on land and their pursuit of farming in its wholesome productive manner would serve as an emulative pockets of light for agriculture and rural living. It would impact signify a novel extension demonstration strategy.

—The self-employed farm graduates invariably possess better managerial capabilities. With these abilities, they are likely to fare better in modern agriculture which requires careful planning, adaptation and application of improved technologies. An agricultural graduate can react rationally to vagaries of rainfall, incidence of pests and diseases, and changing marketing conditions better than ordinary farmers. The managerial capabilities which he exhibits in resource management and utilization would perhaps motivate others to imitate these management practices. So a well informed agricultural graduate can act as adoption-leader of a locality. He can play an important role in information dissemination and can also influence innovation decision making by other farmers in the locality.

—Self-employed agricultural graduates could forge better link between the field level extension functionaries of the State Department of Agriculture and of farmers in that locality. This would
facilitate effective implementation of development programmes. New agricultural technologies could be funneled through these graduates, reducing the time and cost of technology transfer.

—There are many areas in production, processing and marketing of agricultural produce where group action (may be through cooperatives) would be quite useful. Agricultural graduates with their technical expertise could provide the needed leadership for social mobilization and management of these group actions.

—Added to all these is the argument that self-employed agricultural graduates can play effective role in propogating the concept of resident farming - a farmer living right on his farm land engaged in crop and animal husbandry along with associated activities. It is argued that agricultural graduates have the necessary training and also the social obligation to play the deciding role in translating the concept of resident farming into a movement so that efficiency is inducted into millions of small farms with appropriate enterprise-mix.

In brief, economic progress of a country is dependent partly (perhaps mainly) on that segment of population which has entrepreneurial ability. Agricultural graduates settled for self-employment could be successful entrepreneurs, breaking new grounds for the advancement of agriculture.

Self-employment avenues

The dynamics of agricultural transformation during the last two decades has opened up quite a number of self-employment avenues for agricultural graduates. It is articulated that crop farming, livestock and poultry farming, agricultural input and output marketing, processing industry, agricultural service system and many other avenues are open to enterprising agricultural graduates.
Farming: Crop production/seed production/fruits and vegetables/indoor ornamental plants/cutflower production/nurseries of horticultural crops/hatcheries and livestock breeding farms/livestock farming.

Input marketing: Fertilizer mixing/trading, pesticide manufacturing/trading, seed production/trading, agricultural implements and machinery fabrication/trading.

Processing and distribution: Export of agricultural/horticultural products, domestic trade in agricultural products, fruits and vegetables, oil extraction, dairy products and other agro-based products.

Facilitative services: Consultancy services particularly in horticultural crops and agro-industries, quality control of agricultural products, marketing intelligence and agricultural custom services.

The constraints

With all the potential self-employment avenues open, the participation of agricultural graduates in entrepreneurship has been extremely limited. So one of the issues examined by the authors of papers is what constraints have operated on the entry of agricultural graduates to self-employment avenues. Various constraints have been advanced for poor participation of agricultural graduates in agricultural entrepreneurship. (a) Psychological constraints comprising of lack of ability to take even calculated and manageable risk, and lack of achievement motivation. (b) Agricultural graduates like other graduates, get enamoured with high income and job security in Government. Many a times, the society is likely to link illiteracy with farming, and education with
wage-employment especially jobs in Government. (C) Lack of adequate land holding high capital intensity of business enterprises suitable to agricultural graduates, and technical and economic risks associated with these enterprises are rated as yet another set of contraints. (d) The kind of agricultural education which the students get is far from adequate to motivate them for self-employment. There are less opportunities to pick up the knowledge and skill required for effective entrepreneurship. There is a feeling that the education system is not geared up to foster certain characteristics - belief in one’s own ability to seek challenge, love for rural environment and simple living, enjoyment of work, and managerial ability - in our students. As a result they lack confidence to settle for self-employment. (e) Agricultural graduates like other youths with higher education aspire for good standard of living. It is rightly argued that good educational institutions for the school going children, health facilities as also facilities for recreation play an important role in attracting graduates to rural living and occupations. But these facilities are woefully lacking in rural situations, where agricultural graduates are likely to find more avenues for self-employment. (f) Added to all these is the lack of development support from the Government and other institutions. Promise of ‘assistance and incentive’ from the Government and other institutions appears to have not been fulfilled adequately.

Technical training support

The next logical question is what is it which the Agricultural Universities can do to motivate the agricultural graduates to settle for self-employment. It needs to be sorted out the kind of technical training required and the institutional arrangements needed.

---Introduce non-credit skill oriented courses in the university to provide training on appropriate technology
during trimester break. This would imbibe a sense of confidence and practical skills to our graduates.

- Organize farm stay practicals on recognised farms of progressive farmers and successful self-employed agricultural graduates,

- In undergraduate curriculum in agriculture one or two courses on basics of enterprise management may be offered. Introduction of one or two courses in business management could orient the agricultural graduate to the kind of knowledge and skill required for efficient business management.

- Make provision for self-employed graduates to register for any agriculture related courses of the University in which they want to specialise to meet their professional needs.

- Establish continuing Education Departments to provide short term courses and correspondence courses to self-employed graduates. This unit could also be provided with expertise to extend consultancy service for formulating and operating projects for self-employment. The Agricultural Universities could identify the scientists who are willing to take up this additional work of helping those who decide in favour of self-employment.

Differential development support

There are various reasons for which an increase in the entry of agricultural graduates into self-employment avenue is desirable. As indicated earlier, these graduates can be change (technical, social and economic) agents in the rural areas. Their pursuit of farming and farm-related occupations could transmit development ripple effects, accelerating the
socio-economic transformation of rural areas. Self-employed agricultural graduates settled in rural areas can act as centres of growth and development. In view of the possible benefits to the rural society at large, differential development support to self-employed agricultural graduates is supported.

—Governments to examine whether at least 4-5 hectares of land could be allotted to agricultural graduates, with a provision of seed money for land development and for other basic resources.

—Financial institutions to formulate specific schemes to motivate the agricultural graduates to take up self-employment. In this regard, adequate amount of loan coupled with subsidy component may be offered to agricultural graduates who would like to take up agri-business enterprises.

—Encourage agricultural graduates to organise cooperatives to operate projects for self-employment, so that the development support to these cooperatives could be extended.

—Co-opt the self-employed agricultural graduates as members of cooperatives and other rural development organizations, so that they gain social status in addition to working for living.

Agricultural and rural development in India is synonymous with inducting efficiency into production activities of millions of small farms. This induction of efficiency would be facilitated through the development demonstration effects of self-employed graduates settled in rural areas. These agricultural graduates with the suggested training orientation and development assistance could demonstrate what entrepreneurship would mean in agriculture and agriculture-related activities. The economic advancement of any country is
directly proportional to the number and quality of entrepreneurs which it is endowed with. Agricultural graduates may contribute for the development of entrepreneurship among rural people. If development is a process of emergence of new combinations - of products, of process, of inputs and of markets - self-employed agricultural graduates could sharpen and diversify these combinations.
FINANCIAL RESOURCES MOBILISATION FOR FUNDING/ REGION RELEVANT AGRICULTURAL EDUCATION

J. V. VENKATARAM

The importance of the farming sector in general and agricultural education in particular is well known in the process of rural development in India. In recent years, rural population is becoming more and more conscious of the outcome of the Indian agricultural education system. Even as early as 1949, the University Education Commission headed by Late Dr. S. Radhakrishnan emphasized the need for rural Universities. The Indo-American Team (1955-60) also recommended the establishment of Agricultural Universities on the pattern of Land Grant Colleges in U.S. The establishment of Agricultural Universities in 1960s has been acclaimed as an innovation in institution development for transforming Indian agriculture. As a result, there are 26 Agricultural Universities in India at present. However, the need for small compact colleges at the district or taluk level to cater to the needs of regional requirement cannot be neglected.

Rural development was a key theme at the world conference of Agricultural Education and Training held in 1970 at Copenhagen. This clearly reflects the world wide concern about the need for rural development for rapid economic progress. Recently, Dr. G. V. K. Rao’s Committee has recommended the establishment of Agricultural Colleges at Shimoga, Kudige, Mandya, Mudigere and Brahmanavar in Karnataka depending upon the availability of grants and funds. It has also been indicated that the financial outlay

*Paper based on the articles contributed to the Seminar.

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of Rs. 400 lakh for each college would be needed over five years period (perspective plan for the development of U. A. S., Bangalore).

The Agricultural Universities have been established for the purpose of imparting education in different branches of agriculture and allied sciences. The progress has been stupendous in food production. However, with 75 per cent of the people dependent on agriculture, which is likely to continue for many more decades to come, rapid development of agricultural teaching and research assumes considerable importance. This is true because of the fact that technology is a powerful tool for increasing productivity and production in agricultural sector thus eliminating dependance on foreign food imports.

It is needless to emphasize that adequate amount of funds to these Universities is a pre-requisite for effective operation. Agricultural Universities are mainly funded by two conventional sources namely State Governments and Indian Council of Agricultural Research. The State government provides non-lapsable maintenance grants annually to meet the expenditures on activities which are necessary for the functioning of the Universities. Besides it provides plan grants for development of education, research and extension.

The second source is the ICAR, which generally provides grants not only for the development of the Universities but also towards research and certain extension education projects either as 100 per cent grant or on a sharing basis. Internal revenue realised from research stations, students' fee etc. in a way is also available to meet part of the expenditure of an University.

Besides these sources of funds, small share also comes from "non-conventional sources" such as Nationalised Banks, Science and Technology Department etc.
An analysis of the flow of funds from various sources for the University of Agricultural Sciences, Bangalore, reveal that the share of the State Government grants has increased from 45 to 60 per cent between 1965-70 and 1980-85, while the ICAR share has decreased from 45 to 20 per cent. The share of internal receipts have increased from 9 to 15 per cent and that of "Non-conventional sources" from 1 to 5 per cent.

Generally the grants provided by the conventional sources at present are found to be significantly inadequate. Hence, alternative ways and means are proposed for strengthening the financial resources of the agricultural education programme in general and new agricultural educational institutions in particular in the rural areas for effecting rural development.

These alternatives are suggested not as substitutes but as a complementary to the increased grants from conventional sources:

1. Commercialisation of research stations without dampening the research work as well as involving the existing personnel for teaching.
2. Student fee is a major source of income in most of the developed countries. In U.S.A., the student fee covers about 30 per cent of the cost of instruction, while it is just 0.5 to 1 per cent in U.A.S.
3. Consumers of agricultural education and research: These may be categorised into public institutions and private organisations as well as Alumni of the agricultural colleges.

A. Public Institutions: i) All the State government departments which are committed to development of agriculture and allied sectors in particular and rural development in general.

B. Private Organisation: All private organisations/firms which are directly engaged in agriculture business such as Fertilizer companies, Pesticides companies, Tobacco companies, Karnataka Implements and Machineries Co. Ltd, Planters Association etc.

C. Alumni of the Agricultural Colleges: Those past students of the Agricultural Colleges who are reasonably well placed in their business or job in India and abroad may be enthused to generously contribute for "Agricultural Education Fund". These people have a moral responsibility for having been the direct recipients of the benefits of the technical knowledge.

4 Religious Institutions: In India and particularly in Karnataka, there are quite a number of religious institutions sponsoring the general and technical education. Discussion with the heads of these religious institutions may result in substantial donations for meeting the financial requirements of the new agricultural education system.
5. The Directorate of Vocational Education: Yet another source which is presently imparting job oriented agricultural education for students at Pre-University level in rural colleges. These colleges may be upgraded or part of the funds may be diverted for the new agricultural colleges to provide better education in agricultural sciences.

6. Donations from Voluntary Organisations and Philanthropists: The individual philanthropists and voluntary organisations interested in rural development may be motivated to contribute for the Agricultural Education Fund.

7. The Scientists of the Agricultural University: Should be motivated to prepare projects and programs which are acceptable to the public and private agencies for funding. May be a scheme of incentive for such scientists would help to explore the non conventional sources of funding as is being practiced by institutions like Indian Institute of Management etc. In this direction it appears that the Government of Karnataka has already taken an initiative to enthuse the Agricultural Produce Market Committees to contribute to Agricultural Education Fund.

The possible magnitude and some of the alternative sources from which the Agricultural Education cess or Fund could be expected is indicated below:

1. Major irrigation beneficiaries: The area brought under irrigation through major irrigation system in Karnataka is estimated to be 161.77 thousand hectares. At the rate of one rupee per hectare will yield Rs. 1.62 lakh annually which can be collected along with health and general education cess by the Revenue authorities and the same may be transferred to Agricultural Education Fund.

2. The Agricultural Production in Karnataka is around 80 lakh tonnes annually. Assuming that 25 per cent of it is only marketed through market intermediaries or agencies and
if ten rupees per ton is collected as cess towards agricultural education fund would account for Rs. 20 lakh per annum.

3. The quantum of Fertilizer Consumption per annum is about 5.3 lakh tonnes in Karnataka and the fertilizer agencies could contribute one rupee per ton, will yield an amount of Rs. 5 lakh per annum.

4. The Karnataka Agro Corn Products Corporation Ltd., is one of the beneficiaries and users of agricultural commodities. If 5 per cent of the profits of this Corporation is set aside towards Agricultural Education Fund will yield Rs. 1.65 lakh based on the 1983-84 profits of rupees 33 lakh.

5. Karnataka State Warehousing Corporation Ltd., could also be requested to contribute 5 per cent of its profit for the promotion of agricultural education. On the basis of 1983-84 profits of Rs. 37.77 lakhs, it would fetch rupees 1.89 lakhs.

6. The Commercial Crops Production in Karnataka during 1984-85 was about 8.93 lakh bales of cotton, 8.93 lakh tonnes of oil seeds, 143.12 lakh tonnes of sugarcane and 0.29 lakh tonnes of tobacco. If one rupee per ton or per bale is contributed by the agencies involved in trading of these commercial crops alone would provide rupees 156.29 lakh per annum.

7. Assuming that the Karnataka Milk Federation handles at least 50 per cent of the total milk produced (15 lakh tonnes) in the State and at the rate of one rupee cess per ton if collected, will yield rupees 7.5 lakhs per annum.

8. The Forest Department could also collect contributions from the consumers of forest products and this would fetch Rs. 13.14 lakh at the rate of one rupee per ton based on the quantity of different wood species harvested and sold during 1981-82.

Thus, the above mentioned alternatives would be able to mobilise about rupees 207 lakh per annum and this accounts...
for about 85 per cent of the existing U.A.S. Budget. The above are only few illustrations of non-conventional sources for which some data was available. However, the other sources may also be explored as indicated earlier and this would definitely fetch a substantial amount of funds for promoting new agricultural education system aimed at rural development.

A few selected donors may be involved in a limited manner to regulate the use of funds and in the management of the agricultural colleges/universities at the regional level.
RECOMMENDATIONS

Based on the review of all seminar papers received under each of the seven themes, lead papers were prepared by the designated teachers of the Agricultural University, Bangalore and were distributed among the participants along with all other papers, for their perusal and suggestions.

During the Seminar period each theme paper was presented and discussed under the chairmanship of recognised scientist(s) in seven sessions.

The following recommendations emerged out of the discussions on the lead papers and other papers circulated, in addition to the suggestions made by the Chairman of each session.

I. AGRICULTURAL EDUCATION AT PRIMARY, SECONDARY AND PRE-UNIVERSITY LEVELS

i) The objectives of Agricultural Education

The specific objectives may be to:

1) Develop favourable attitude towards agricultural production processes.

2) Develop awareness of rural environment and conservation of natural resources.

3) Introduction of skill-oriented training to provide opportunities for gainful employment in agriculture.
ii) Nature of Agricultural Education at different levels

1) Primary - I to VII Std.
   a. School children should be made aware of agricultural resources like, land and water available in the village community and the crops grown.
   b. Wherever possible school land laboratory should be developed to train the children through learning by doing.
   c. Practical activities could be organised during evenings as a part of play ground activities.

2) High School - VIII to X Std.
   a. Study of agricultural subject should be made compulsory.
   b. A Committee should be set up to develop appropriate programme for compulsory course in agriculture. This Committee should consist of experts from Department of Education, Agricultural Universities, State Department of Agriculture and other Central Institutes.
   c. Individual or group projects in agriculture can also be assigned to students.

3) Higher Secondary - XI and XII Std.
   Vocational courses in specialised trade in agriculture leading to diploma in agriculture may be developed, considering the requirements of the locality where the school is operating, to cater to the needs of the local people and the farming system.

iii) Involvement of Development Agencies
   At present the rural schools are not having educational infrastructure and sufficient number of teachers
to teach agricultural subjects. Therefore the Department of Agriculture personnel should help in teaching agricultural subjects at various levels, which would indirectly help in training teachers through informal contacts.

iv) Opportunity for vertical mobility

1) The students opting for vocational courses in agriculture should have opportunity to get into the College - Agricultural College, Science or Arts Colleges.

2) Teachers Training Courses like TCH and B.Ed. should have agriculture component to enable these teachers to teach agriculture at primary and secondary levels.

3) At +2 level, vocational courses in agriculture should be taught by an agricultural science graduate who has specialised in the subject and has the knowledge of teaching methodology.

II. AGRICULTURAL POLYTECHNICS

1) There is an urgent need to establish Agricultural Polytechnics offering Diploma courses in various branches of agriculture technology and there should be one such polytechnic in each district of the State. However, keeping the present resources constraints of the State in view, it is strongly recommended that at least one agriculture polytechnic in each division/region should be established, in and around Regional Research Stations. Such polytechnics are supposed to catalyse the change agents attitude towards agricultural profession and cater to the needs of middle level and lower level technical and skilled personnel to work in various spheres of agriculture.
It was stressed that the vocationalization of education through agricultural polytechnics would go a long way in utilization of human resource potential among rural youths.

2) The Agricultural Polytechnics should offer diploma course of three years duration after 10th Std. similar to Engineering Polytechnics, with a scope for students to get into higher education. The courses for the proposed Agricultural Polytechnics should be so formulated as to cover the essentials of the present pre-university science courses plus the practicals on agricultural technology. This would prepare the students not only for skills in and orientation in favour of agricultural technology, but also give them opportunity and eligibility for higher studies in any branches of professional education such as agriculture, engineering and medicine.

3) Agricultural Polytechnics should also conduct short term courses/training programmes to cater to the local technical needs of the farmers.

4) As to the organizational set up, Agricultural Universities should be entrusted with the responsibility of establishing and running Agricultural Polytechnics in the State. This would provide the needed sound academic base and stature to the new institution.

III. RURALIZATION OF AGRICULTURAL EDUCATION

1) When the institutions are started in specific agro-climatic regions, students of that particular region should be preferred over others, for admission in such institutions.
There should be dispersal of educational institutions in rural areas, based on the needs of the people in that area.

Resources of the local areas should be mobilized for imparting education to the students of that area.

Regional Agricultural Research Stations should be developed as Junior Colleges for undergraduate education and the main campus/campuses of the University should be for postgraduate education.

IV. PRACTICALS FOR INDUCTING WORK EXPERIENCE IN AGRICULTURAL EDUCATION

1) The practical contents should be upgraded and made relevant to live situations while at the same time matching them to theory subject. Towards this end, the infrastructural, laboratory, field and transport facilities should be strengthened with additional budget provisions. The theory and practical ratio need not be uniform but has to be fixed depending on the subject matter and type of course. Practical content of the course should necessarily meet the course requirements. For efficient conduct of practicals, the batches have to be small, not exceeding 30 per batch.

2) It is recommended that many more Agricultural Universities initiate the 'Practical Crop Production (PCP)’ courses/work experience programmes/projects in various areas such as Fisheries, Forestry, Sericulture, Dairy Sciences, Poultry etc. In the Universities where such a programme already exists, greater facilities and resources like land, water and inputs may be made available.
3) The programme may be extended to help the needy students to earn while learning, which should be beyond course requirements as optional activity. The production-oriented projects under the guidance of a monitoring cell, not only promotes acquiring skills by the students but also enthuse confidence and projects a self-image, leading to a greater extent a will for seeking self-employment at the termination of the degree course. The 'Earn while you Learn' schemes should be initiated, strengthened and encouraged in all the Institutes right from the day the students enter the colleges. The Institutes should designate a few dedicated teachers to assist in this programme.

4) The degree courses in Agricultural Sciences have to be need-oriented to produce professionals who are fit to take up agriculture as an enterprise. The courses in U.G. level have to be re-framed positively to make them impart modern techniques. More practice of working with machineries like tractors, planters, threshers, processors etc. should be provided; standard manuals have to be prepared for each practical course.

5) Students should be fully exposed to the development programmes of the State and ICAR during village stay practicals or Rural Agricultural Work Experience Project (RAWEP). The extension methods should be taught in live situations taking advantage of NEAP and Zilla Parishaths. Besides, they should be exposed to the whole village life facets of agriculture, animal husbandry, education and other institutions. There should also be a two-way communication between students and farmers. In plant/placement/internship/hospital/production unit, study programmes be introduced in degree programmes.
The Seminar has strongly emphasised intensive training programme in production-oriented courses. The quality and standardization of instructional programme should receive a greater attention. Village stay practical or RAWEP should form integral part of Agriculture degree programme.

V. DISTANCE EDUCATION

1) Every Agricultural University in India may undertake distance education as one of the methods of transfer of technology.

2) A separate unit of distance education may be created in the University.

3) Distance education may reach extension worker of the development departments, statutory bodies, voluntary organisations, farm men, farm women and youth. It should also be open to all other category of people within the geographical area served by the University.

4) Distance education shall not issue certificates to the participants seeking jobs outside their farms and homes.

5) The communication methods most appropriate for distance education are:

   — Correspondence lessons (course) coupled with assignments, response sheets and personal contact programmes.
   — Radio programmes on line with farm school on AIR.
   — Audio-visual medium like television.
   — Personal contact sessions by a group of experts.
   — Off-campus training with the help of mobile training unit.
Incentive for the training in the form of prizes, recognition, certificates indicating the completion of the training programme.

6) Distance education in every agricultural university must be initiated in the form of correspondence course coupled with practical training for the award of degree and postgraduate degree for persons with minimum age of 35 years. This shall be in line with the other universities awarding degrees and postgraduate degrees in Science and Arts.

7) Local groups at the receiving end of the information must be formed, recognised and used for skill training and for feedback.

VI. SELF-EMPLOYMENT FOR AGRICULTURAL GRADUATES

i) Technical Training Support

1) To introduce non-credit, skill-oriented courses in the university to provide training on appropriate technology during trimester break. This would help to imbibe a sense of confidence and practical skills in graduates.

2) To organize farm stay practicals on recognised farms of progressive farmers and successful self-employed agricultural graduates.

3) In undergraduate curriculum in agriculture one or two courses on basics of enterprise management may have to be offered. Introduction of one or two courses in business management could orient the agricultural graduate to the kind of knowledge and skill required for efficient business management.

4) There is a need to establish continuing education departments to provide short term courses and
correspondence courses to self-employed graduates. This unit could also be provided with expertise to extend consultancy service for formulating and operating projects for self-employment. The Agricultural Universities could identify the scientists who are willing to take up this additional work of helping those who decide in favour of self-employment.

There should be special diploma courses on agriculture business management for a period of one year to equip them to operate agriculture and allied enterprises efficiently on a business proposition.

5) There is a need to organise special refresher courses in the commercially important aspects like inland fisheries, commercial crop production, seed production, animal husbandry and the like for a period of 2 to 3 months duration by the agricultural universities.

6) There needs a changed emphasis in our education methods, from theory to practical or skill-oriented teaching during the course curriculum with an orientation to develop confidence among them for taking up self-employment.

ii) Differential Development Support

1) Governments to examine whether at least some land could be allotted to agricultural graduates, with a provision of seed money for land development and for other basic resources. However, there was a note of descent from some part.

2) Financial institutions to formulate specific schemes to motivate the agricultural graduates to take up self-employment in this regard, adequate amount of loan coupled with subsidy component may be offered to agricultural graduates who would like to take up Agricultural business enterprises.
3) Encourage agricultural graduates to organise cooperatives to operate projects for self-employment so that the development support to these cooperatives could be extended.

4) Co-opt the self-employed agricultural graduates as members of cooperatives and other rural development organizations, so that they gain social status in addition to working for living.

5) There is a need for the Government support to such motivated agricultural graduates in overcoming the constraints with regard to land, irrigation facility, capital and other incentives.

6) The existing situation demands a change in the attitude of the unemployed agricultural graduates on one hand and the society at large on the other hand, about the status in society with regard to taking up agriculture as a profession in view of the fact that agriculture is being looked down in terms of the professional status accorded.

VII. MOBILIZATION OF FINANCIAL RESOURCES FOR (PROMOTING REGION RELEVANT) AGRICULTURAL EDUCATION

The existing resources from the conventional sources are inadequate and hence there is need for alternative ways and means to strengthen the financial resources for agricultural education.

1) Funds from non-conventional sources may be pooled into "Agricultural Education Foundation Fund".
2) The consumers of Agricultural Education and Research such as corporations, boards, federations, cooperatives, private companies and individuals should be enthused to contribute generously towards Agricultural Education Foundation Fund.

3) The state governments should allocate 1 to 2% of the total state plan or 10 to 25% of the total state plan allocation to agricultural development, for agricultural education.

4) The governments should not take into consideration the increased internal revenue of the Universities while allocating funds and the internal revenues may be used by the universities for development activities only.

5) The surplus government lands may be transferred to the university for establishing commercial farms which can help in augmenting financial resources with sufficient funds for creating infrastructural facilities.

6) The commercialization of research stations without dampening the research work may be taken up by the universities.

7) As a step in the direction of better management of existing funds it is suggested that the non-academic expenditure should be minimised.

8) The criteria for allotment of funds by ICAR needs a review and this should be in relation to the population and backwardness of the State.

9) There is a clear justification for enhancing the student fee structure in a phased manner.
10) It is proposed to create "Agricultural Research Policy and Advisory Committee" with Secretary, Agriculture of the State as its Chairman and other members representing the Agricultural Universities, ICAR, Agricultural Scientists, State Developmental Departments and farmers, to develop procedures relating to research requests of private agencies.
National Seminar on Agricultural Education for Regional Development and Self-Employment Nov. 12-13, 1987

PROGRAMME

12-11-87

Inaugural Session Welcome
10-00 to 11-30 a.m. Dr. R. Ramanna
Dean, UAS

Inaugural Address
Sri J. P. Sharma, IAS
Secretary to Govt. of Karnataka Agriculture and Horticulture Department

Presidential Address
Dr. S. V. Patil
Vice-Chancellor, UAS

Vote of Thanks
Dr. M. K. Sethu Rao
Director of Extension, UAS

Session I Agricultural Education at Primary, Secondary and Pre-University Levels
Chairman:
Dr. R. Ramanna
Dean, UAS
Session II
12-30 to 1-30 p.m.

Agricultural Polytechnics

Chairman:
Dr. R. Narayan
Former Dean, UAS

Rapporteurs:
Prof. Chandrasekhara Buggi
Mr. N. Narasimha

Presentation of Lead Paper:
Dr. M. K. Sethu Rao

Session III
2-30 to 3-30 p.m.

Ruralization of Higher Education in Agriculture

Chairman:
Dr. G. Parmeswara

Rapporteurs:
Dr. V. Veerabhadraiah
Mr. M. Ranganath

Presentation of Lead Paper:
Dr. R. Ramanna
Session IV
3:45 to 4:45 p.m.
Practicals for inducting Work Experiences in Agricultural Education

Chairman:
Dr. C. P. Ghonsikar
Associate Dean and Principal, College of Agriculture, Parbhani

Rapporteurs:
Dr. K. Shivashankar
Mr. M. S. Nataraj

Presentation of Lead Papers:
Dr. K. M. Jayaramaiah
Professor and Head
Dept. of Agricultural Extension, UAS

13-11-87

Session V
9:00 to 10 a.m.
Self-Employment for Agricultural Graduates

Chairman:
Mr. H. T. Reddy
Member, Board of Regents, UAS Bangalore

Rapporteurs:
Dr. Y. Katteppa
Mr. D. Nanjappa

Presentation of Lead papers:
Dr. S. Bisalaiah
Registrar, UAS

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<th>Session VI</th>
<th>Distance Education with Special Reference to Agricultural Sciences</th>
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| 10-00 to 11 a.m. | Chairman: Dr. K. N. Kar  
Director, Distance Education  
OUAT, Bubaneswar |
| Rapporteurs:  
Dr. B. S. Siddaramaiah  
Mr. B. V. Chinnappa Reddy |
| Presentation of Lead Papers:  
Dr. M. B. Channegowda  
Training Coordinator, UAS |

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<th>Session VII</th>
<th>Mobilization of Financial Resources for Promoting Agricultural Education</th>
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| 11-15 a.m. to 12-15 p.m. | Chairman: Dr. A. Ramamoohan Rao  
Dean, (PGS), APAU Hyderabad |
| Rapporteurs:  
Mr. G. Nanjunde Gowda  
Dr. Lalith Achuth |
| Presentation of Lead Papers:  
Dr. J. V. Venkataram  
Professor and Head  
Dept of Agricultural Economics, UAS |

| 12-15 to 1-15 p.m. | Finalization of recommendations |

| 2-30 to 4-00 p.m. | Plenary Session  
Welcome: Dr. M. K. Sethu Rao  
Director of Extension, UAS |

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Presentation of Recommendations:
Chairman/Rapporteur of each session

Address by the Chief Guest:
Dr. G. Thimmaiah
Economic Advisor to Government of Karnataka

Presidential Remarks:
Dr. S. V. Patil
Vice-Chancellor, UAS

Vote of Thanks
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