

**POLICY
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Stakeholders' Perceptions on Employment Oriented Agricultural Education



NAAS

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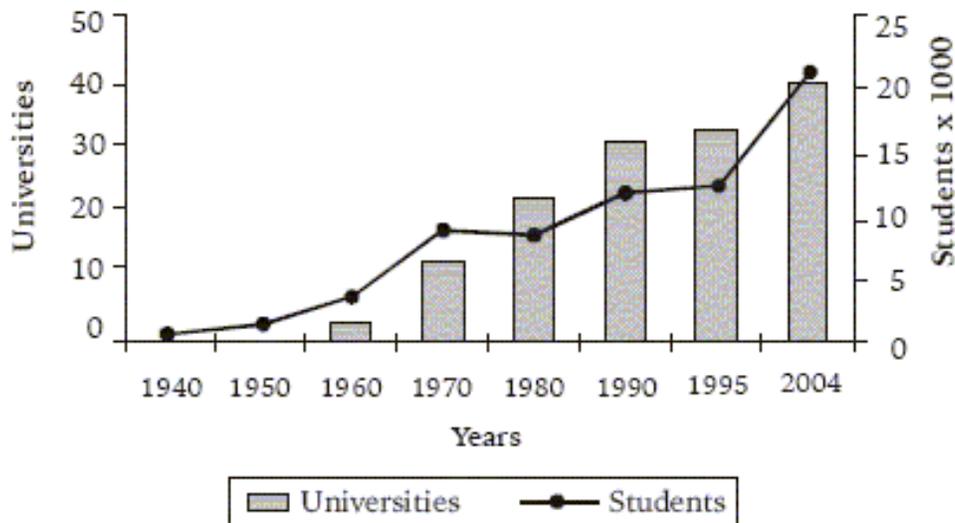
Introduction

India is principally an agricultural country. Seventy per cent of the Indian population lives in villages. Fifty-nine per cent of the total workforce depends on agriculture for its daily bread. Almost 25 per cent of the gross GDP is contributed by agriculture. So striking is the dependence of growth in Indian economy that it follows the ups and downs in growth rates of agriculture. One out of every eight rupees earned through exports owes its origin to agriculture. A steep surge in production since late 1960s has made country self-reliant in foodgrain production with buffer stocks full to the brim. Since Independence, 0.66 per cent growth/year in gross agricultural area combined with 2.67 per cent/year increase in foodgrain production led to a net increase in per capita foodgrain availability from 395 g/day to 475 g/day. An outstanding achievement, as it happened despite an unabated population build up at a rate of 2.15 per cent/year or 13 million more mouths to be fed every year. Not only in foodgrain production, the country has made revolutionary progress in milk, fish, eggs, fruits and vegetables production also. It is the self-sufficiency in food that has raised the international status of India. It is this exalted exuberance that has infused decisive confidence to negotiate with an incisive voice on many sticky clauses of global treaties and conventions.

Technically qualified manpower provided the base for the radical metamorphosis of agriculture—what William Doug of USA called Green Revolution. A study by IFPRI on linkages between government spending, growth in productivity and poverty in rural India showed that investment in education was among the major contributors for both poverty reduction and productivity enhancement. Right since independence, the country laid maximum emphasis on the development of its human resource through education. In support of that slowly and steadily a comprehensive system of higher agricultural education has been evolved and developed. The system consists of state agricultural universities (SAUs) and their constituent/affiliated colleges, deemed to be universities (DUs), central universities (CUs) having agricultural faculties, Central Agricultural University (CAU) and a number of public and private funded agricultural colleges. Compared to a total intake capacity of about 1,500 students per year at the time of independence; currently, some 21,000 agricultural graduates and postgraduates are produced every year. Despite this whopping rise, hardly there is an attempt that links trends of employment needs of various sectors of economy (public, private or self-entrepreneurship) and clients (students, farmers, agri-industry) against the kind and number of manpower produced by the system of higher agricultural education. With that persisting neglect, there is no visible concern on making projections on manpower demand and supply at the national level. Also, the system lacks a country level computerised manpower information system with the facility of updating, retrieval and dissemination of information to serve the policy objectives corresponding to development and utilisation of graduates and postgraduates that education system churns out every year. As it exists, the emphasis is achieving the set targets of admission capacity without matching it with the changing market demand for employment. Already there is an air of all round concern for rising unemployment among agricultural graduates and postgraduates.

Figure 31.1

Agricultural Universities and Admission Capacity



In view of the above concerns, NAAS organised a brainstorming session on, Employment Oriented Agricultural Education.*

Salient recommendations emerging from the deliberations are given below.

Recommendations

1. General

- Indian higher agricultural education setup consists of some 260 colleges imparting education in diverse disciplines of agriculture and allied subjects, animal and veterinary sciences, fisheries, agricultural engineering and home science. These colleges are either constituents of 34 SAUs, 5 DUs, 3 CAUs, 1 CAU or are affiliated to 17 general universities. Of the 21,000 graduates and postgraduates produced annually, nearly one-fourth is girls; one half comes from rural background.

* NAAS organised a brainstorming session on “Employment Oriented Agricultural Education” on 9 February 2004, under the Convenership of Dr. J.C. Katyal, DDG (Education), ICAR. The purpose was to examine the status of national agricultural education system and the kind and number of manpower it generates. In order to reach this goal, discussions also focused on the employability of graduates and postgraduates vis-à-vis the changing market demand. What should be the possible reforms in the agricultural higher education, that would harmonise the increase in number of graduates and postgraduates with the generation of employment, was another key objective of these deliberations. Academicians, education management experts, industrialists, NGOs and students participated in the session.

The programme started with the opening remarks by Dr. V.L. Chopra, President NAAS followed by Dr. J.C. Katyal’s presentation giving overview and key points for discussion. The entire group brainstormed issues flagged by Dr. Katyal for discussion.

- Until early 1990s, number of graduates and postgraduates produced by the agricultural education system was not large when seen from the employability point of view. With maximum absorption of graduates and postgraduates in government jobs, problem of unemployment was hardly an issue. Public sector was absorbing more than 50 per cent of the total stock of graduates and postgraduates. This situation has changed dramatically with the spin-off effects of liberalisation and opening up of the economy becoming clearer and clearer. Currently, unemployment among graduates and postgraduates is so rampant that it can hardly go unnoticed or remain unattended. Many reasons are behind this development.
- With food situation becoming comfortable, agricultural S&T is no more a priority sector of government funding. This has adversely affected the availability of jobs in public sector. Opening up of economy lays far greater emphasis on the development of private enterprise; reducing thereby the over dependence on public sector for employability. Accordingly, number of government jobs in public sector has been on the decline. Also, growth in processing industry and services sans updating of conventional course curricula and methods of its delivery to support these ventures has dichotomised the kind of marketable and produced manpower.
- Since, consequences of ongoing shifts in world economic order and associated trends in surge of sectors and activities are seen to grow in future, reengineering of agricultural education to suit their requirements for graduates and postgraduates is a must. Significant adjustments in syllabi and time for practical and practice sessions also become necessary, in that, products of our agricultural education setup are professionals who do not hunt around for jobs but can create jobs for themselves. On the one hand, self-employable individuals are answer to problem of joblessness, on the other, they are projected to play a crucial role in extending applicability of S&T for eradicating poverty by making farming cost effective and its produce more diversified, market appropriate and profitable.
- In order to introduce more time for practical classes and practice sessions, there is need for liberal investments to create appropriate physical plant and build relevant competence in teaching faculty. Against this perceived exigency, public funding for agricultural research and education, in reality, has tightened as the food situation has eased. Falling investment was viewed with concern, since, it was neither conducive to fight scourge of poverty nor for infusing greater application of R&D for sustaining growth in agricultural productivity. According to an IFPRI report, investments in agricultural R&D and education, next only to roads, are the most influential investments made for poverty alleviation and productivity enhancement. Current share of agricultural education within the total budgetary provisions does not seem all that impressive.
- With 90 per cent of a university's budget consumed for payment of staff salary and committed establishment charges and the remaining appropriated by research, hardly much is left for effecting improvements in content and delivery of education. In fact, distinct provision for education improvement is unheard of in the existing broad heads of budgeting in the SAU system. Education is treated as a routine and casual activity involving a professor lecturing students herded in a classroom. Use of modern information and communication technologies for enhancing student-professor

interactivity in teaching and learning during practical and practice sessions is either nil or very low. In fact, teacher-taught coalition is a model adopted in other parts of the world to effect intended improvements in agriculture through products of education.

- In order to unshackle education of the existing passive mode of teaching, investments on upgradation of course curricula by refreshing the content and refashioning the mode of delivery were considered necessary. The importance of overarching knowledge needs in emerging areas of frontier sciences, economic activity and environmental concerns and competence of teaching faculty needs to be appreciated. As it exists, teaching faculties neither possess adequate knowledge to launch courses in these upcoming subjects nor exude confidence to handle interactive sessions involving face-to-face traditional mode or modern open and distance learning techniques. Since, knowledge base of a teacher and his competence to deliver that knowledge are the key determinants of effective teaching and learning, investment for training and retraining of faculty was considered necessary. In order to empower teachers with knowledge and overhaul their teaching skills, it was suggested to make training part and parcel of budgeting and service conditions through launch of an instrument of HRD Policy.
- ICAR continues to support SAUs, DUs and CUs for infusing reforms in agricultural education to make it more relevant and useful to diverse stakeholders. Some improvements like, development of model course curricula, uniform guidelines and norms for management of academics, have taken place but are not enough to link education to employability, alleviating poverty or sustaining country's economic growth without harm to health of natural resources. Nearly 12 per cent share of education, within the overall budgetary provisions of ICAR, constitutes merely 2 per cent of the total budget of SAUs. There is an urgent need for raising investments by State and ICAR to institutionalise reforms for building quality of agricultural education.
- The proportion of agri-sector contribution to GDP is going down, whereas value addition is on the rise. Accordingly, emphasis needs to shift for developing manpower in industrial agriculture than in general agriculture.
- Apart from the expanding job possibilities in private sector, there are some planned programmes of GoI for environmental conservation and employment generation. Typical examples are promotion of biodiesel involving investment of Rs. 15,000 million and propagation of bamboo at a projected cost of Rs. 10,000 million. Besides, there are focused changes in the Extension Policy of GoI. Whether these are setting up of farmer call centres, launch of agricultural channel or establishing one Krishi Vigyan Kendra in each rural district of the country the avowed purpose is to take agricultural technology to farmer's doorsteps. While revising the curriculum and programmes of agricultural education, these initiatives of GoI and attendant policies need to be taken into consideration.

2. Regulation

- Recent mushrooming of private colleges and universities at an unprecedented pace is alarming. These quickies entice academically mediocres for admissions into various courses and charge them fee, which is unproportional to infrastructural

facilities and quality of education they offer. More worrisome features of this development are: (i) the illconceived legalisation of affiliation of private colleges by certain SAUs against the provisions of the ICAR supported Model Act for State Agricultural Universities, (ii) prevailing disregard to ensure existence of a minimum physical plan before private institutions are licensed to begin imparting education and (iii) absence of an enforcing mechanism to accredit these institutions after they have been opened. Additionally, with profit as the prime motive, private institutions end up hiring substandard human resource for teaching also. There is a need for establishing a regulatory authority within ICAR/DARE to sustain quality of agricultural education on the lines of UGC and AICTE.

- ICAR/DARE in alliance with Indian Agricultural Universities Association may develop a draft policy paper for creation of a statutory but autonomous authority within former's ambit. Once this draft is vetted from legal angle, it can be converted into a bill for approval of the Parliament. Since an Accreditation Board to assess quality of agricultural education already exists, what is now required is to empower it with legislative authority to enforce quality. As it prevails, agriculture, including higher agricultural education, is a state subject. This situation contrasts with other professional courses, whose regulation of growth and quality vest constitutionally with the Union government.
- Agricultural education needs to be made compulsory at school level preferably during 5th–8th standard, as it exists in Uttar Pradesh or elsewhere in the world i.e., China, Chile and Brazil. From an optional subject status, it should be made compulsory and integrated into the existing science curriculum syllabus.
- Agricultural courses, offered as a separate stream at school level in certain states of the country, should be recognised equivalent to science stream. Students opting and passing this stream should be eligible for admissions, like science stream subjects, to graduate and postgraduate courses. Participants perceived that this shift would attract more students to join agricultural courses at senior secondary level.

3. Reorienting Agricultural Education

- Any attempt to reorient agricultural education for employability must be preceded by a need assessment on the kind and number of manpower projected to serve upcoming sectors of economy and country's national commitments (i.e., poverty reduction, employment generation, non-degrading use of natural resources, taking scientific information and knowledge to farmers' reach and value addition) and international obligations and happenings (various issues arising from World Trade Agreement, General Agreement on Trade in Services, ethics of Intellectual Property Rights and Genetically Modified Organisms and Foods). It is necessary to review the present skill composition of graduates and postgraduates *vis-à-vis* futuristic job profiles in consonance with needs of various stakeholders (public institutions, private enterprises, service industry, NGOs and self-employment seekers).
- In order to assure a steady flow of takers of the government sponsored agri-business and agri-clinic schemes for selfemployment of graduates, the need for introducing business management, trade, marketing, cooperatives, banking and credit related

subjects in the existing syllabi was recognised. Simultaneously, in-vogue exclusive emphasis on formal degree programmes was felt to be harmonised with non-degree skill oriented certificate and diploma courses to bolster villagebased technical services. Introduction of lower-tier education was seen to create a cadre of para-professionals who can serve as an interface between farmers and graduate professionals. As in other fields (i.e., medicine and engineering), these lower level professionals are crucial in enabling farmers in knowledge application and giving feedback on relevance and applicability of the existing knowledge and in developing new knowledge.

- It is proposed that the proportion of time allocation for theory and practical at various levels of education can be as follows:

UG : Theory & Practical 50-50 per cent

Diploma : Theory & Practical 40-60 per cent

Certificate course : Theory & Practical 20-80 per cent

- In view of the fast expanding developments in modern information and communication techniques (ICT) for education in natural and social sciences, it was realised that agricultural education cannot afford to ignore their use any more. In addition to emphasis on ICT-based curriculum delivery techniques, it was also felt to explore the potential and possibility of introducing open and distance learning (ODL) opportunities alongside traditional classroom mode of education. Tie-up with organisations/institutions which impart education through ODL was considered a preferred option to find out the extent and prospects of introducing their use in agricultural education where experiential learning demands 50 per cent or more of a student's time.
- More than formal education, exploring the use of ODL in training and retraining of faculty, graduate professionals and para-professionals to keep them abreast with the new knowledge and developments in S&T was suggested. Harnessing flexi time, space and pace potential of ODL in offering lifelong learning opportunities for farmers and farm workers, particularly those belonging to fair sex, was recommended as a key strategy to build a knowledge society. Whether the goal is to anchor necessary structural and contextual improvements to make formal agricultural education better or the mission is to build human competence through non-formal education for infusing science-driven growth of agriculture, investments for efficient and effective materials and methods of teaching and learning come in the forefront of all other investments. A refinement in knowledge base of faculty and farmers on a continuing basis is a fundamental strategy world over to enhance agricultural productivity and profitability and to alleviate rural poverty.

4. Practice Training

- In line with the focus of the brainstorming discussions on reorienting agricultural education to support employability, participants envisaged the need for developing professional competence and capability through integration of teaching in modern subjects with learning in real life situations. Unfailingly, the new syllabus must be relevant, responsive and sensitive to serve the needs of various stakeholders. In

that endeavour, reengineered education ought to support selfemployment (individuals), employability in upcoming sectors of economy (private e.g., business houses, processing industry, transfer of technology through NGOs or consortia of specialist individuals) and development of graduates and postgraduates well versed with issues and concerns arising from WTA, IPR, GATS and other conventions and treaties ratified and signed by India.

- While the need for introduction of courses and programmes in biotechnology, food processing and packaging, business management including codex standards, marketing, trade and credit/lending institutions and international agreements was recognised, one year practical training in any subject of professional learning in field, model plants, factory, business enterprise or engineering workshop was also recommended.
- Practice training will cover every aspect of a chosen vocation from beginning (say cultivation) to end (say consumption) and will be closely supervised and periodically evaluated. In view of this recommendation, participants called for redesigning RAW (rural agricultural work experience) to accommodate hands on training in actual field or factory conditions. In-depth discussions followed to find answer to the question, “whether the one-year practice training should be continuous or spread over the four-year duration of the course?” Majority view was to have six months supervised training at institution based and managed instructional farm, model plant or workshop. During this period, teachings in theory and practice should be juxtaposed in time and space. Remaining six months training should be in the farmers’ fields, a commercial farm, business house, processing industry or engineering workshop. The argument favouring this arrangement is that those of the students who are attached to private sector for training in the 3rd year and follow-up with a project writeup assigned by the private sector they have better chances of getting absorbed there. Somewhat similar arrangement is happening in engineering education and it can be adopted with appropriate refinements in agricultural courses also.
- Training for appropriate period, preferably one year, is desirable with flexibility in training type. Accepting this viewpoint, it was agreed that typically institutions with strong focus on basic subjects need to prepare students in unconventional areas like global trade and treaties with international perspective. With socioeconomic courses it was felt that three months practice training was enough at UG level as the students have to be strong in theoretical aspects.
- PG research should be as per national priorities, institutional mandate and stakeholders’ needs. Its planning, objective setting and methodology should be conceived with that perspective. Involvement of concerned individuals (farmers’ representatives) and groups (processing industries) right at the point when institutional deliberations are held on research priority area identification and conceptualisation should be ensured.

5. Subject Area Diversification versus Specialisation

- Compartmentalisation of disciplines based on mindless multiplicity of subject areas was unhealthy. It distanced professionals from farmers who seek new knowledge on entire production system rather than that of an isolated discipline.
- Existing diversification of subjects into 11 faculties at UG level hardly serves any significant cause of specialisation. More or less syllabus coverage is similar for the first three years. In the guise of diversification, students develop a narrow focus, which is not desirable from the point of developing a wide learning canvas and overall comprehension of art and science of agriculture. Majority of the members in the house felt that at the graduate level the need is to produce generalists. Their specialisation should emanate from one year spent for practical training.
- Multiplicity of programmes at PG level needs a re-look. Currently, M.Sc. and Ph.D. degrees are awarded, respectively in 95 and 80 disciplines. It was agreed that consolidation of subject areas should be attempted keeping in front the existing ground realities and emerging economic and environmental scenes and scenarios. A specific recommendation was made that at PG level the specialisation through major and minor fields of study must rise from problem solving research on a topical theme covering crop/animal, commodity or system. It was further urged that thesis research representing a blend of upstream basic and downstream-applied research ought to be founded on envisioned national priorities and mandated institutional mission. Reformatting programmes on these lines will expectedly offer a holistic view to education in building knowledge economy. This will also help in incorporating sustainability perspective, which from the prevailing viewpoint should integrate various aspects of water, energy, health, agriculture and biodiversity.
- The UG:PG ratio is very narrow in agricultural and allied sciences as compared to other professional streams like medicine and engineering. Keeping in view the increasing role of dissemination of fruits of research and development in enhancing productivity, alleviating poverty and ensuring biosphere integrity, it was recommended to consolidate, and wherever necessary, to prune PG education. The room, thus created, could be used to strengthen village-based services by reorienting UG education.
- A spin-off effect of rising number of graduates opting for postgraduate education is amassing lower quality graduates to service rural communities. There is mismatch between the existing supply of graduates in conventional agricultural subjects and their need in upcoming areas like agri-business management, agro-processing, dairy technology and veterinary services, marketing and storage, environment, biotechnology and information and communication technology. Hence, education at UG level, alongwith basic subjects on strengthening farm services, must cover syllabi in theory and practice of business management against the backdrop of produce handling, marketing and environment principles.
- Whether it was strengthening of village based services or producing graduates in emerging subject areas, admissions beyond the present numbers should not be stretched. Instead it was recommended to launch need and skill-based certificate and

diploma courses to produce a cadre of para-professionals who would support graduate and postgraduate professionals in their pursuit of serving rural communities.

6. Admissions

- The present system and procedures of admissions, based on merit, common entrance test or merit-cum-common entrance test, were considered satisfactory.
- As the dividing line between mathematical and bio-sciences is becoming thinner and thinner and also considering the importance of bio-physics and mathematics, the students from these backgrounds could also enter agricultural courses. Likewise, it was recommended that graduates from pure science stream should also be admitted in postgraduate courses, if they accept to take add-on remedial courses to build knowledge base in agriculture.
- Suggestion to permit arts and commerce students to enter professional agriculture courses at graduate level was not supported.
- Admissions to various subjects and disciplines should be based on regular reviews and assessment of job markets and corresponding manpower needs. In order to forecast future employment, patterns, including stakeholder perspective, were of fundamental necessity. Since, shifts in job markets follow rising or falling importance of various sectors of economy, a country's national commitments and international obligations and happenings (emergence of genetically modified foods and organisms), subjects and methods of teaching and learning must be open ended with possibilities to infuse fresh ideas as and when necessary. For measuring up to these expectations, it was recommended to hold more frequent meetings of academic councils and boards of studies to refine subject contents and to introduce new disciplines. In gathering presence and input of diverse stakeholders in these discussions was considered an invaluable strategy and distinct opportunity to enhance scope and relevance of reengineered course curricula.

7. Reorientation of Agricultural Education: Stakeholders' Viewpoint

- Private seed sector expressed preferential interest in candidates with postgraduate qualifications to: (i) develop new varieties/hybrids, (ii) maintain quality, seed health, farm advisory services and (iii) generate related technology. Their specific demand for graduates was in the area of seed multiplication, field supervision and marketing. In order to fill this need, the seed sector wanted to focus on these aspects while rewriting the course curricula.
- NGOs spelt out the need for graduates and postgraduates well versed in organic farming, bio-tech applications in agriculture, input use knowledge, standard agronomic practices, natural resources management and ecological principles, processing, packaging, cold chain management, diagnostic techniques to identify nutritional disorders and diseases of both plants and animals, weather information and advisory management, ITK and its scientific enhancement, WTA covering IPR, rural development programmes, crop insurance, banking and credit lending institutions and

markets and marketing. A new look syllabi should contain subjects and methods of delivery to build appropriate knowledge and skill base of futuristic graduates.

- In order to define the knowledge profile of para-professionals, besides building pedantic knowledge and practical skills in a particular vocation, the prospective candidates should be provided with opportunities to gain information and knowledge on village life, rural livelihood means, natural resources and native ecological principles of their use, traditional practices and beliefs *vis-à-vis* modern techniques on raising diverse crops, livestock including their varieties and breeds, necessary use and maintenance of farm implements and machinery, practical exposure to general field problems and basic expertise in employing and linking present day communication means for interpreting weather advisories and market trends.

8. Entrepreneurship Building

- Entrepreneurship training to prepare graduates for setting up farm advisories and services (agri-business and agri-clinics) should not be treated as a separate activity of teaching and learning. In place of current practice of imparting training after graduation, building entrepreneurship competence and spirit should be integrated into the re-scripted course curricula. In order to support service needs of diverse production systems, each SAU/institution must offer a basket of region-specific entrepreneurship courses. In pursuance of that objective, erecting necessary infrastructure for practical sessions and building faculty competence to teach refashioned courses were identified as the frontal strategies and investment initiatives.
- Specific entrepreneurship trainings for faculty should be organised at the leading institutions like NDRI in Dairying, IARI in agriculture, CIFE in fisheries, IVRI in animal health and Diagnostics, NAARM in education technology and some premier SAUs in known areas of excellence.
- With possible entry of big corporate houses into contract farming looming large, doling out of more franchises for micro-enterprises was expected. It was recommended to prepare graduates in appropriate knowledge and skills so that they are able to embrace these micro-enterprises with maximum ease and minimum investment and risk.
- Business in any enterprise is capital intensive; agriculture for that matter is no exception. Because of procedural wrangles, bank loans are not easy to come by. In many instances, investments in agricultural enterprises may not prove remunerative also. Softening loan and credit terms is necessary to attract more and more students setting up agri-business and agri-clinics for self-employment and service of rural communities.

9. Gender Sensitisation

- Gender stereotyping i.e., offering specially tailored soft assignments to girl students was unanimously opposed. Instead it was recommended that gender sensitisation be integrated into the curriculum i.e., uniform subject code for boys and girls. The contributions by male and female students to various aspects of agriculture can be

reflected in the curriculum. More than course curricula reorientation, participating girl students wanted all out efforts to create basic facilities like boarding and lodging, which at present are deplorably poor. It was recommended that ICAR might consider giving one time special financial dispensation to build at least two hostels/SAU to accommodate girl students.

10. Faculty and Facility Development

- ICAR needs to enhance its support for faculty development both in terms of funding as well as encouraging greater number of training programmes such as summer/winter schools or conduct of refresher courses through centres of advanced studies. Courses and programmes building competence in upcoming areas of education and skill development should receive priority.
- Faculty may be placed for short spells as work culture observers in appropriate industry. This exposure is foreseen to help in forging and developing linkages with industry for subsequent placement of student trainees. More importantly, short-term placement of this kind will be highly useful in changing faculty's outlook in assigning graduates for real life training and research in industrial agriculture.
- Mechanisms for providing some kind of incentives to retain best students for faculty jobs should be devised.
- To complement faculty output in reorienting agricultural education for employability, the crucial role of strengthening and building appropriate facilities and infrastructure for teaching and learning was recognised. In furtherance of that cause, specific one time financial support was sought for creating state-of-the-art facilities for experiential learning in practical farming, commercial agriculture, dairying and food processing plants, soil and water testing, disease and nutritional disorder diagnostics and farm machinery maintenance and repairs. In summation, reorientation of agricultural education within a reasonable timeframe and visible impact on employability should be launched as a mission to introduce necessary structural changes in system and setup to capture modern realities, challenges and opportunities. In fulfilment of that mission, partnership with various stakeholders, who influence and are influenced by the quality of agricultural education, ranks first among the reforms. Emphasis of futuristic agricultural education should be on introduction of a revised course curricula embracing new teaching and learning areas (typical examples; agri-business and entrepreneurship, diversification of farming, processing and value addition, natural resources and environment management, marketing, international trade and treaties and biotechnology) and delivery systems (information and communication technology), deployment of highly qualified faculty, creation of infrastructure for extensive practical sessions and linkages with private partners to support career building training.