

**Draft Document**

**National Agricultural Education Project**

**ICAR  
EDUCATION DIVISION  
2012**

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**Detailed Project Report of the  
National Agricultural Education Project (NAEP)**

**1. Introduction**

Agriculture is the main source of livelihood for over 80% of the rural poor in India. Although, it employs about 52% of the labor force, it contributes to only 14.4% of GDP and 10.23% of all exports. Rural women, who constitute 30% of the agricultural work force, are amongst the least paid workers. Any effort of poverty reduction and economic development must address the problems being faced by the agricultural sector and turn the challenges into economic opportunities for the poor.

India achieved spectacular agricultural growth since 1966. The increase in food grain production from a meager 51 million tonnes in 1950 to about 245 million tonnes in 2011-12 is a remarkable achievement unparalleled in the history of world agriculture. Similar enhancement in production of milk, fish, oilseeds and fruit & vegetables has also been observed. Green, blue, yellow and white revolutions have been responsible for bringing in prosperity to the farming community. The cradle of the success, besides government policies and high receptivity of the farming community, has been the establishment of institutions of higher agricultural education. These institutions developed new breed of skilled human resource who were instrumental in not only generating new technologies but also in their assessment, refinement and dissemination to the farming community.

Human Resource development is critical for sustaining, diversifying and realizing the potentials of agriculture. Agricultural human resource development is a continuous process being undertaken through partnership and efforts of the components of the Indian Council of Agricultural Research (ICAR) - Agricultural Universities (AUs) System comprising 53 State Agricultural Universities (SAUs), five Deemed to be universities (DUs), one Central Agricultural University (CAU) and four Central Universities (CUs) with Agriculture Faculty. The Agricultural Universities in India set up on the 'land grant' pattern of USA have contributed immensely to human resource development as well as enhancement of agricultural productivity and production in the country over the years. The system of education in Agricultural Universities was basically taken from USA pattern, that greatly enabled incorporation of a number of diverse subjects in the courses as also provision of hands-on practical experience to the students.

Agricultural education has now to evolve in tune with fast changing national and international scenario. Future agriculture is dominated by looming dangers of food insecurity originating from an unholy alliance of existing and emerging issues such as stagnating/declining productivity and profitability; degradation and depletion of natural resources; increased risks in the face of changing climate; unsafe livelihoods for millions of small and marginal farmers; regional imbalances in agricultural productivity; rising

input costs, unsound profits and vulnerable markets; changing food habits and quality concerns; high post-harvest losses and fragmented processing industry; globalization of trade and commerce; weakened technology transfer system; fossil fuel crisis and growing emphasis on bio-fuels encroaching upon good agricultural lands; poorly coordinated natural disaster management system, and the looming prospects of bioterrorism etc.

The present situation demands a renewed thrust for enhanced quality and relevance of higher agricultural education so as to facilitate and undertake human capacity building for developing self-motivated professionals and entrepreneurs in view of the changing scenario of globalization of education, emergence of new areas of specialization such as IPRs, other WTO-related areas, techno-legal specialties etc., and the cutting edge technologies such as biosensors, genomics and biotechnology, alternative sources of energy, nanotechnology, etc. The graduates are required to possess professional capabilities to deal with the concerns of sustainable development (productive, profitable and stable) of agriculture in all its aspects. Also, the education should address the stakeholders' expectations especially for utilitarian mode.

Further, there is need for agricultural graduates having knowledge, skills, ability and also entrepreneurship to provide a class of village-based services such as diagnostic laboratories, advisories on new innovations, markets and avenues of development assistance for corporate and contract farming. Industry and universities partnership is essential if industry is to obtain well-trained agricultural professionals in cutting edge technologies for international competitiveness.

Despite the laudable contribution made by the ICAR- Agricultural Universities system towards technology generation, human resource development and extension education, India's present higher agricultural educational scenario suffers from low access, not meeting quality standards, low funding, gender inequality, non-contemporary course curricula and delivery methods, inbreeding, lack of faculty-competence in cutting edge technologies etc.

The State Agricultural Universities are established through the Legislative Act of the respective State and with major financial support from them leading to administrative and policy controls. ICAR, is vested with the authority to promote and ensure quality assurance in agricultural education, as per the decision of the cabinet in 1973. In discharge of this function the ICAR has taken a number of initiatives for agricultural education. During Agricultural Human Resource Development Project (1995-2000), many reforms were put in place which inter-alia include establishment of the Accreditation Board for quality assurance, measures for reducing inbreeding, new curriculum and delivery, faculty competence enhancement, infrastructure development in select four universities, access to information, modernization of libraries, emphasis on education technology etc.

The ICAR continues to provide professional and partial financial support to them for enhancing the quality, relevance and access of higher agricultural education. Currently, the support is for policy, quality assurance through accreditation, common academic regulations, course curricula and delivery systems, improvement of faculty competence, promoting excellence through scholarships/fellowships, Niche areas of excellence, experiential learning units, National Professors, National Fellows, Emeritus Scientists, admissions of students through All India competitions, modernization of

farms, IT support and up-gradation of infrastructure and facilities including libraries. Recent initiatives include new UG and PG curriculum based on IV Deans' Committee and National Core Group recommendations, introduction of experiential learning and Niche Areas of Excellence, availability of 1700 Journals on line through CeRA, fellowships (SRF and International Fellowships) and NTS, strengthening Centres of Advanced Studies, introduction of the Adjunct Professor Scheme and modernization of AU farms etc. In addition, good support has been provided under X and XI Plan for improving and modernizing infrastructure for teaching-learning.

These measures have led to reversing trend of the decline in the quality of agricultural education though much needs to be done to achieve our target. As of now the pace and quality of technology generation and human capacity building in most of the SAUs have slackened owing mainly to inadequate state funding, depleted faculty strength, inadequate faculty development programmes, lack of competence of existing faculty in new and emerging areas, extensive inbreeding in faculty, lack of modern infrastructure for education and research. Establishment of new and sectoral state agricultural universities and new colleges without matching resources has compounded the problem.

Based upon the review and lessons learnt from earlier project, and a perspective built on existing concerns and emerging scenario, the present proposal makes a mission statement, outlines objectives, strategies and activities to be covered to make Agricultural Education attractive, demand-driven and rewarding. The proposal also provides details on budgetary needs and guiding criteria to select SAUs and DUs for inclusion in the Project. The project would help to implement strategic reforms in the existing system in India to produce the required professionals. The reforms focusing on effective governance, quality assurance, promotion of excellence, openness and linkages and improved services to stakeholders would lead to sustainability and responsiveness of the system. It will also assist in increased access, equity and competitiveness in higher agricultural education.

## **1.1. Agricultural Education in India**

### **1.1.1. Evolution of Higher Agricultural Education**

Agricultural education system in India distinctly evolved during pre independence era on the British system of education and post-independence era on the US Land Grant Colleges pattern. The available records show that the earliest agriculture college was established at Saidapet (near to present day Chennai city) in 1877. It was followed by setting up of the first Veterinary College in the undivided India at Lahore (now in Pakistan) in 1882. A three-year Veterinary Science course was started in 1884 at Parel, Bombay. It was in 1889, when real beginning of research started with the launch of an Imperial Bacteriological College at Poona. Besides those mentioned above, some more Veterinary Colleges were founded at Calcutta (1893) and Madras (1903).

Also as a sequel to the 1876-78 famine, Lord Curzon - the then Viceroy of India (1898-1905), realized that the government must pay priority and urgent attention to the development of agriculture. Thus, in the beginning of the 20th century, an Agricultural Research Institute each at Pusa in Darbhanga district (now Samastipur) of Bihar (subsequently named Imperial and now Indian Agricultural Research Institute) and Coimbatore in the present-day Tamil Nadu were established in 1905. Agricultural

Colleges were also established at Kanpur, Lyalpur (now in Pakistan) and Nagpur in 1906, Poona in 1907 and Sabour in 1908. Following the initiation of the graduate level programmes by the Agricultural Research Institute beginning 1905, a two-year postgraduate diploma, also known as “IARI Associateship”, was initiated at the then Imperial Agricultural Research Institute, Pusa in 1923.

On the recommendations of the Royal Commission on Agriculture (1928), Imperial (now Indian) Council of Agricultural Research was created in 1929 to provide further impetus and support to the already existing Agricultural Research Institutes. In the early 1930s, postgraduate programmes leading to M.Sc. and Ph.D. degrees in agriculture were started. The Madras Veterinary College with affiliation from the University of Madras in 1936 launched a 4-year B.V.Sc. course. Further thrust to veterinary education was given with the establishment of five more veterinary colleges between 1946 and 1948 at Mathura (1946), Rajendra Nagar (1946), Jabalpur (1948), Jorhat (1948) and Hisar (1948). Before the start of these veterinary colleges, a degree courses in agricultural engineering began in the early 1940s at the Allahabad Agricultural Institute (now a deemed to be university). By 1947 - the year of India’s independence, there were 17 agricultural colleges affiliated to general universities.

After independence, Govt. of India appointed University Education Commission under the Chairmanship of Dr. S. Radhakrishnan to review higher education and suggest measures for meeting the future requirement of the country. The Commission recommended that Agricultural Education be recognized as a major national priority so that the country is able to feed itself. The Commission recommended establishment of autonomous rural universities and accord them same facilities as were available to other universities including substantial grant-in-aid from the centre for development. Based on Dr. S. Radhakrishnan Commission on University Education and subsequent two Joint Indo-American Study Teams (1955, 1959) recommendations, first agricultural University was set up in Pantnagar in 1960, which paved the way for establishment of agricultural universities in other states.

**Table 1: Landmarks of Agricultural Education**

<b>Year</b>	<b>Landmarks</b>
1952	Indian Council of Agricultural Education (ICAE) set up (worked up to 1964 under ICAR).
1958	First `Deemed University` status bestowed on IARI.
1959	Chief of Agricultural Education and ex-officio Secretary to ICAE appointed.
1960	Emergence of SAUs, starting with Pantnagar, based on the recommendations of Joint Indo-American Teams.
1965	Standing Committee on Agricultural Education replaced the Education Panel.
1965	ICAR reorganization with four Divisions including Agricultural Education.
1966	ICAR developed Model Act for Agricultural Universities in India.
1973	Second reorganization of ICAR with the establishment of Department of Agricultural Research and Education (DARE) to provide greater

	autonomy to ICAR, and Regional Committees to take care of regional needs, and creation of Agricultural Research Services (ARS) and Agricultural Scientists Recruitment Board (ASRB).
1974	Norms and Accreditation Committee (NAC) replaced Standing Committee on Agricultural Education.
1988	G.V.K. Rao Committee recommendations to revamp the functioning of ICAR including its role in Agricultural Education.
1995	Agricultural Human Resource Development (AHRD) project, with World Bank Support, launched (ended in 2001).
1996	Accreditation Board established replacing NAC.
2007	IV Deans Committee revised UG course curricula and syllabi, and norms, standards and academic regulation.
2009	National Core Group revised PG (Master's and PhD) course curricula and syllabi and the common academic regulations.

### 1.1.2. Agricultural Education - Present Setup

Establishment of Post Graduate School at IARI in 1958 was a landmark step that heralded establishment of agricultural universities in India. Today, we have a net work of 53 State Agricultural Universities (SAUs, including 16 specialized Veterinary and Animal Sciences and Horticulture and Forestry Sciences Universities), one Central Agricultural University (CAU), five Institutes having Deemed-to-be-Universities (DUs) status (four of them are ICAR Institutes: IARI, New Delhi; IVRI, Izatnagar; NDRI, Karnal and CIFE, Mumbai and, the fifth Allahabad Agricultural Institute, Allahabad) and four Central Universities (CUs) with Agriculture faculty (BHU, Varanasi; AMU, Aligarh; Vishwa Bharti, Shantiniketan and Nagaland University, Medziphema). The universities are modeled on US land grant university pattern with integration of education, research and extension education and, have contributed a great deal in propelling agricultural growth in the country. With about 265 constituent colleges having about 35,000 student-intake capacity, the AUs impart education in 11 major disciplines at undergraduate and about 95 subjects at post-graduate level. In higher agricultural education, about 55% students are from rural back ground and, on an average, 36% are the girl students. Besides, the IIT, Kharagpur imparts education in the field of Agricultural Engineering, and about 100 privately owned colleges, majority of them affiliated to general universities while some, particularly in the States of Maharashtra and Chhattisgarh, affiliated to SAUs, impart higher agricultural education to over 10000 students annually.

#### 1.1.2. Role of ICAR

The ICAR provides support for policy, quality assurance through accreditation, common academic regulations, updated and contemporary course curricula and delivery systems, improvement of faculty competence, promoting excellence through scholarships/fellowships, Niche areas of excellence, experiential learning, National Professors, National Fellows, Emeritus Scientists, admissions of students through All India competitions, modernization of farms, IT support and up-gradation of infrastructure and facilities including libraries. It is however, recognized that the major support comes from the respective state governments.

With a view to provide legal base for establishment and functioning of agricultural universities, the Government of India appointed an Agricultural University Committee headed by Dr. Ralph W. Cummings in 1960. This Committee submitted its report in 1962 in the form of a Model Act. The ICAR further developed this recommendation and brought out its first Model Act for State Agricultural Universities in 1966. The intent was to help to bring about uniformity in the Acts of SAUs and its governance structure and organization. The Model Act was revised in 1984, 1994 and again in 2009.

During the early phase of SAUs' establishment, funding from Centre and State was adequate for development of excellent infrastructure including laboratory facilities, equipments, libraries and research farms. Up to VI Plan, almost 33 percent of the ICAR budget was devoted for strengthening agricultural education in the country and this is the major reason that most of the Universities established during that period have excellent infrastructure which is largely contributed by the ICAR. The share of Agricultural education in ICAR budget was 8.9% in VIII Plan to 14 % in X Plan and 21.5% in XI Plan. In absolute figures, it has increased from Rs. 224.69 crores in the IX Plan to Rs. 1019.85 crores in the X Plan and the XI Plan's allocation was Rs. 2585.00 crores. However, with time, the number of universities and their constituent colleges and departments increased, but the budgetary provisions did not increase at that rate. Sectoral division of SAUs into different subject areas has also contributed to their rising number and falling financial share. Consequently, the financial health of SAUs, in general, is precarious. It is imperative to enhance budgetary support both at the Centre and the State level to attain and sustain enhanced capacity for technology development and quality of research & education.

In order to have quality assurance in agricultural education, ICAR initiated a series of steps. These include setting up of Norms and Accreditation Committee followed by establishment of Accreditation Board in 1996, course curriculum revision through Deans Committee, networking and strengthening of SAUs through development support etc. Recognizing the need for quality improvement in agricultural education, World Bank supported ICAR through Agricultural Human Resource Development Programme with an outlay of US \$ 74.2 million for bringing in much needed reforms in agricultural education. The major reforms brought in through this project included: establishment of Accreditation Board, norms and standards for improving education, capacity building for human resource development, faculty competence improvement, and efforts for reducing inbreeding such as All India Competitive Examination each year to fill 15% UG and 25% PG seats in all SAUs, 300 National Talent Scholarships at UG level awarded to students who opt to move out of their state of domicile, award of 475 Junior Research Fellowships each year to students on merit for M.Sc programme only if they join programme in the University other than from which they obtained UG degree, and recruitment at Assistant Professor level in all SAUs based on NET conducted centrally by Agricultural Scientists Recruitment Board.

## **2. National Agricultural Education Project**

### **2.1. Background**

Human Resource Development needs to address both the emerging areas of agriculture as well as consolidating technology gains and farming experiences. In view of economic liberalization and coming in of WTO, it is important to generate globally competitive human resource which would help in achieving higher productivity and production through generation and transfer of technologies making full use of recent advances in frontier areas like molecular biology, biotechnology, nanotechnology, diagnostics and vaccines, conservation agriculture, processing and value addition, food safety and quality, information technology, etc. Basic and Social Sciences are at the same time important to understand the basics, relevance and applications of technology. This has necessitated the development of human resource which would have skills and expertise to address the issues emerging out of not only development of newer technology but also their transfer to improve the production system, value addition and concerted efforts in export of agricultural produce.

In spite of a series of efforts made by the ICAR, it has not been possible to bring about a satisfactory level of uniformity in norms and standards in academics, universities' governance, quality and relevance of education, financial health and policies on human resource development. These limitations in turn adversely affect the task of producing high quality skilled agricultural graduates and postgraduates. The Accreditation Board is making serious efforts to enforce norms and standards for quality education, but lack of statutory powers with ICAR and adequate financial resources to effect a change hinder the full compliance by the SAUs of the recommendations made by the Accreditation Board.

Analysis of the present agricultural education system indicates that despite finalization of academic regulations for UG and PG programmes after Third Deans Committee report and initiatives under the Agricultural Human Resources Development Project (AHRDP) and later on through IV Deans committee and the National Core Group, wide variations exist in quality and performance. Universities still suffer from poor governance. The system as a whole has not taken full advantage of modern tools of management for efficient governance. The faculty in SAUs has dwindled with majority chunk of the posts remaining vacant due to financial crunch. Besides curriculum and curriculum delivery have not been changed keeping in view global technology development. There is also no link of curriculum to employment in private agribusiness and processing industries and meeting the demands of extension.

The major policy goals in the National Policy for Farmers -2007, inter alia, include restructuring the agricultural education curriculum and pedagogy for enabling every farm and home science graduate to become an entrepreneur and to make agricultural education gender sensitive. The Technical Advisory Committee on Secondary Education Report submitted to the Planning Commission also suggested modifications of the current curricula to emphasize value addition beyond production of food grains, fruits and vegetables. Agricultural graduates would require knowledge and

training in bio-based products, processing and marketing. Accordingly, relevant courses need to be developed.

Past experience of the AHRD project has shown that capable human resource can yield a catalytic effect in strengthening and making the agricultural education relevant and better responsive. While capacity enhancement through infrastructure development and HRD initiatives remains necessary, it was not found sufficient to sustain performance. Need was felt to focus on internalizing processes that contributed to creation of performance enabling environment. In this pursuit, institutionalization of good governance framework (a three-dimensional structure combining internal processes, performance management and accountability assessment) is a requisite to bear improvements in agricultural education.

## **2.2. Problems to be addressed**

**2.2.1. Poverty, unemployment and malnutrition among agricultural dependent population:** Food will remain available in plenty but may stay inaccessible to many due to poverty. Poverty is closely aligned to malnutrition. Its alleviation will require far more attention than that in the past, since India continues to tenant the largest number of poor in the world (250 millions out of nearly 1000 millions worldwide). Almost 75% of the poor live in villages. Majority of them are small and marginal landholders and landless laborers. They over-crowd agriculture for their livelihoods with limited or marginal productivity. Also they overexploit natural resources because they have hardly anything else to depend upon for subsistence. Harmonizing science and technological (S&T) inputs will be an inescapable imperative to nurture rural livelihoods without degrading the quality of natural resources. Education and training for capacity building to gain access to employment will be necessary. In addition to awarding formal degrees, SAUs and other Institutes/Organizations will be required to initiate job driven vocational programmes to build avenues of off-farm work.

**2.2.2. Need for integrating Agricultural Education with job creation:** Currently, almost every graduate looks for a white-collar job preferably in public sector. With government resolve to phase out non-performing assets, job opportunities in government sector are shrinking faster than the number of graduates coming out of SAUs and other institutions. According to an estimate (IAMR, 2001), 43% of the graduates and 23% of postgraduates (M.Sc.) find difficulty in accessing gainful employment. Hence, in order to ward off rising unemployment because of excessive dependence on public sector jobs, there is need to develop graduates/postgraduates who create their own work and provide work to others also. In this pursuit, futuristic Agricultural Education will need to be enriched with real life subjects and their delivery through project work rather than through mere classroom lecture alone. Although the recently revised curricula and syllabi of UG and PG programmes have to some extent addressed these issues, still there is need for reorienting them to address stakeholders concerns and needs.

**2.2.3. Price tag on S&T output:** With greater inflow of funds for S&T from the private sector and non-public institutions, the output is likely to bear a price tag. Besides,

advice/consultancy on new innovations will not be available for free. Government of India Scheme on setting up of privately owned Agri-clinics and Agri-business Centers across the length and breadth of the country is a step towards paid extension. With that perspective, graduates who come out of universities will be required to be professionals and not mere degree holders. A radical change in the existing course curricula by infusing more management related courses and practice sessions to apply the knowledge thus acquired would become necessary to churn out professional service providers.

**2.2.4. Demand from client groups:** Client groups including farmers and consumers would be more aware on relevance and utility of science and technology (S&T) findings. Their concerns would become integral part of agricultural S&T activities and programs. Strong monitoring and evaluation systems would be required to be setup to review the relevance, utility and impact of various educational programmes.

**2.2.5. Global economic order:** Agricultural education is needed to be harmonized with existing and emerging issues related to WTO and free market economies. Worldwide, agriculture is becoming competitive price-wise and its produce acceptable quality-wise. Price and brand equity have become more prominent than before. Indian agriculture is no exception and its objectives have to align with stakeholders' needs, clients' perspective, peer concerns and market vibes. Greater infusion of frontier science subjects (biotechnology, nanotechnology, precision agriculture and information and communication technology), legal aspects, good practices of trade, ethics of IPR and GMO, market intelligence and modern information and communication techniques have become more important to promote efficiency, awareness, equity, and competitiveness in agriculture. In pursuance of that, development and institutionalization of easily accessible and user-friendly knowledge systems to support decision making by various client groups has become necessary.

**2.2.6. Lack of adequate resources with educational institutions:** The SAUs are charged with complete integration of teaching, research and extension for holistic rural development. Most of the SAUs have not been able to achieve integration of these functions due to limited physical, financial and appropriate human resources. Comfortable food situation and concerns in other areas of human welfare (disease, malnutrition, environment) should not be allowed to stand in the way of raising public investments in agricultural education, which is in forefront of S&T development. Through innovative programmes (consultancy, enrollment of foreign students, sale of seed/planting material etc.) SAUs and other public supported Institutions will be required to raise their own resources for S&T. Linkages and partnerships among SAUs and other public and private sector institutions will be an inescapable imperative to become more efficient in financial management and value add to output with minimum investments in inputs.

**2.2.7. Faculty and students:** Quality of education in most of the agricultural universities is adversely affected due to shortage of teaching faculty, lack of motivation and opportunity for development of faculty with time and space and

the regional inbreeding. Certain disciplines like Agricultural Economics, Agricultural Meteorology, Agricultural Statistics although integral to the curriculum, yet lack the required faculty in many institutions. Quality of students entering the agricultural education has been gradually improving but is still below the mark which calls for making agricultural education more attractive, demand driven and rewarding.

**2.2.8. Changing HRD needs with scientific advancements:** With the advances in science and technology in general and agriculture and allied sectors in particular, changing economic status, life styles, food habits and demand for processed/value added foods and the global vision, the curriculum would need to be periodically reoriented with increased emphasis on secondary agriculture. Enabling environment for effective teaching-learning with national and global linkages would need to be established.

**2.2.9. Vocational Training:** Small and marginal farmers, landless laborers, farm women and school drop outs in villages constitute bulk of the 40 million unemployed or semi employed work force of the country. They are not able to have gainful employment mainly because of lack of technological empowerment. On the other hand, the State Agricultural Universities churn out the graduates and post-graduates much below the HRD capacity of these institutions. Universities are concentrating mainly on formal education while there is also need for non-formal education especially in respect of knowledge and technological empowerment of vast section of work force in rural areas. This will expand the opportunities for off-farm employment and decrease dependence of large segment on agriculture resources for livelihood. Neglect of middle level skill and manpower development appears to be major lacunae for ensuring livelihood security. The absence of well structured vocational programmes have created communication gap in not only effective transfer of technology from lab to land but also becoming partner in agriculture transformation. Vocational training on a large scale in various fields can partly bridge this gap. Rural youth unable to pursue higher education, school and college drop outs, women in agriculture who have no facilities of higher education can easily be provided skills and oriented towards agriculture vocation as per their traditional occupations. This will lead to total transformation in rural areas.

**2.2.10. Distances and Disconnects:** With time and space, the inter as well as intra-university dialogues and cooperation have decreased. Even faculty of the different departments in a college don't sit together to address the academic issues, lest the inter college interactions. Further, interactions/collaborations/linkages with the general universities, ICAR institutes and institutions like IITs and IIMs are almost missing which impinges upon the teaching- learning process as well as the academic environment in the institution.

### **2.3. Goal and Objectives**

The **goal** of the National Agricultural Education Project would be **“To improve and sustain quality of higher agricultural education for addressing emerging challenges for livelihood security and sustainable development”**.

In pursuance of this goal, the **objectives** would be to bring improvements, achieve excellence, enhanced relevance and high efficiency in the agricultural higher education system, and the agricultural universities to offer enhanced services to benefit farmers, rural women and other stakeholders.

## **2.4. Process of Project Development**

In August 2010, the ICAR constituted the following committee to finalize a document on National Agricultural Education Project.

1. Dr. Panjab Singh, Ex-Secretary, DARE & DG, ICAR	Chairman
2. Dr. S.L. Mehta, Ex-VC, MPUAT, Udaipur	Member
3. Dr. P.G. Chengappa, Ex-VC, UAS, Bangalore	Member
4. Dr. Arvind Kumar, DDG (Education), ICAR	Member
5. Dr. P.K. Joshi, Director, NAARM, Hyderabad	Member
6. Dr. R.K. Mittal, ADG (EQR), ICAR	Member Secretary

The Committee discussed the base paper prepared by the Member Secretary in its first meeting on 6.10.2010 and decided the course of action. Subsequently, for inviting suggestions for reforming and renewal of higher agricultural education, two Sectoral Consultations (i) with the stakeholders including industry/industry associations, successful entrepreneurs and the State Development Officers on 29.11.2010, and (ii) with persons having experience of governance such as selected Vice Chancellors of AUs, Secretary of Ministry of Human Resource Development, Secretary General of the Association of Indian Universities and IAUA, and representative from Central University (BHU) on 30.11.2010, were organized. This followed a Consultation at UAS, Bangalore on January 19, 2011 which was graced by Dr. K. Kasturirangan, Member (Science), Planning Commission, and participated by several past and present Vice Chancellors and Deans and Directors of the AUs in Karnataka, Karnataka State Officials of the Department of Agriculture and Horticulture and several industry leaders. Finally, a National Consultation on Higher Agricultural Education was held on February 21, 2011 at New Delhi that was inaugurated by Hon'ble Minister of State for Agriculture Shri Harish Rawat and participated by all Vice Chancellors of AUs and some distinguished academicians. Guidance and suggestions of the Secretary, DARE and DG, ICAR Dr. S. Ayyappan was available in all the Consultations.

In all the Consultations, suggestions were received about how to reorient the higher agricultural education to make it attractive, rewarding and globally competitive, and how to improve and sustain the quality and relevance of higher agricultural education particularly what should be done with regard to issues related to faculty, students, curriculum and its delivery mechanisms, governance, structure and funding of AUs, and developing linkages, partnerships and convergence. All the suggestions were later discussed in the Committee meetings and the final recommendations for programme and activities are included at S. No. 5.

## **2.5. Target beneficiaries**

Rural youth, farmers, industry, public sector, development departments.

## **2.6. Project strategy**

The Project objectives would be achieved through two components with distinct modes.

- 2.6.1. **Systemic Reforms** - funded in a non-competitive investment mode - would include (a) reforms in governance and increasing system's internal efficiency; (b) ensuring compliance with ICAR's quality assurance policies, criteria and procedures, and strengthening accreditation and quality monitoring capacity; (c) human resource need assessment and strategic planning, and (d) attracting young talent to agricultural education.
- 2.6.2. **Institutional Development** - Institutions would be funded through a selection mechanism. Selection criteria will be developed during project preparation -- these will reflect institutions' willingness to reform, and their potential and vision for development. This component would support (a) restructuring and modernization of undergraduate and postgraduate programmes in various specializations; (b) promotion of academic excellence in critical/emerging areas at postgraduate and doctoral levels; (c) increasing scope and effectiveness of networking with educational institutions and research organizations within India and abroad; and (d) enhancing reach and effectiveness of agricultural education to agribusiness, farmers and rural women. Efforts would also be made to increase public-private partnership in agricultural education through the increased role of the private sector in curriculum design, faculty and students development, research and development, institution's governance, and providing a window for direct project support for other specific initiatives.

## **2.7. Programmes and Activities**

### **2.7.1. Systemic Reforms**

#### **2.7.1.1. Reforms in Governance of AUs and increasing System's internal efficiency**

**2.7.1.1.1. Organizational reforms:** In order to achieve uniformity in structure and functioning of the universities for enhanced efficiency and inter-institutional acceptability, it is essential that all SAUs adopt the Model Act for Agricultural Universities in India (2009) developed by the ICAR in consultation with all Vice Chancellors of the AUs. Adherence to the provisions of the Act related to uniform tenure and retirement age of Vice Chancellors; selection and tenure of university officers; constitution, powers and functions of the statutory bodies; and integration of education, research and extension, deserve consideration.

**2.7.1.1.2. e- Governance in AUs:** Presently, most AUs are functioning in traditional ways that require manpower, time, space and have inefficiencies. To make it efficient and vibrant, e-governance will be introduced by providing necessary hardware and software and training for operationalization. This will be achieved

utilizing internal experience and out-sourcing. Effort will be to make the office work paper less.

**2.7.1.1.3. Financial Management System:** Financial management is crucial to an institution and its efficiency will be enhanced through putting in place the FMS software with necessary capacity development.

**2.7.1.1.4. Project Implementation and Monitoring Unit:** For implementation and monitoring the activities of the project, a Project Implementation and Monitoring Unit will be created at the Education Division, ICAR with deployment of core manpower and contractual resource persons and support staff.

### **2.7.1.2. Strengthening of and Compliance with Quality Assurance Policies and Mechanisms**

In 1996, ICAR established Accreditation Board with three sectoral committees and developed comprehensive accreditation system to regulate the quality of agricultural education in the country. The new process of accreditation has been welcomed by all AUs and so far many universities have been accredited and others are in the process of accreditation. Through implementation of the new process for over ten years, many of the short comings have come to fore. Need has been felt to develop a new system of accreditation which will be objective, transparent and enable periodic monitoring of quality improvement efforts made by the academic institutions. There is also need for convergence of accreditation system among different national and international agencies. The Accreditation Board needs to be further strengthened and provided power on the pattern of NAAC, so that it leads to not only compliance for quality improvement but also a mechanism for continuous improvement in the quality of education. There is also need to develop policy papers in respect of academic regulations, norms and standards as well as personal policies for sustaining quality of higher agricultural education. Developing the capacity of an institution for continuous internal quality evaluation is critical and will be addressed.

### **2.7.1.3. Human Resource Need Assessment– Strategic Planning for 2030**

Presently human resource development is largely based on adhocism in total disregard of man power need assessment in different sectors of Agriculture for example, large State like Bihar has a very limited intake in Agriculture compared to Maharashtra which admits disproportionately high number of students. Sectorally, there is a high demand for competent human resource in the area of Veterinary and Animal Sciences Dairy Technology, Food Technology, Horticulture, Fisheries and Agri Business Management but the number of graduates coming out in these disciplines is lower than the requirement. In fact, there is no creditable system of human resources need assessment. In order to have proper and adequate development of human resources, it is necessary that human resources planning is undertaken on scientific basis so that enrollment in disciplines is regulated. This would require need assessment for professionals in specific subject areas, review of their

training needs for sustainable performance and career advancement. It would also be important to consider knowledge and skill profile needs of prospective job market. Therefore, man power need assessment and organization of workshops sectorally at national level and involvement of different stakeholders in review and assessment of skilled human resources sectorally will be undertaken.

#### **2.7.1.4. Attracting young talent to agricultural education**

In order to attract talent in higher agricultural education and research, an innovative ASPIRE Scholarship programme is being recommended. This will attract 10+2 pass outs from colleges to go for higher agricultural education and enable them to face the emerging challenges of agriculture and food security in an imaginative and business like way. The scheme aims to offer 2500 scholarships every year to talented youth in the age group 17-22 years, for undertaking Bachelor and Masters level education in agriculture and allied Sciences with following Criteria for Eligibility for ASPIRE Scholarships:

- a. Based on Performance in Board Examinations: The candidates should have obtained aggregate marks in the top 2% in the Board examination at XII levels.
- b. Based on Performance in Competitive Examinations: Performance within the top 10,000 ranks in Joint Entrance Examination of IIT, AIEEE (Engineering) and top 5000 in CBSE medical examination and joining degree level courses in Agriculture or allied sciences in ICAR-AU system.
- c. Value and Type of Support: Eligible candidates will receive annually scholarship @ total value Rs. 120,000 per candidate. The cash value payable to the ASPIRE scholarship holder is Rs. 90,000 per annum. A summer time attachment fee of Rs. 30,000 will be paid to the mentoring institution for undertaking summer time project.
- d. Duration of the Support: Selected candidates will be supported for a maximum period of six years starting 1<sup>st</sup> year course in agriculture and allied science, except Veterinary Science for which the maximum duration may be 7 years, and integrated course leading to Masters degree or the completion of the course, whichever is earlier.

#### **2.7.2. Institutional Development**

##### **2.7.2.1. Promotion of academic excellence in critical/emerging areas**

###### **2.7.2.1.1. Faculty development**

Quality of education in most of the universities is adversely affected due to shortage of faculty, little opportunities for faculty development and aging/superannuating faculty. Only 65% of the sanctioned faculty strength remains filled and over 50% universities have over 30% vacant faculty positions. Average age of teaching faculty is around 50 years or higher. Out of tune, outdated and old faculty restricts creative and forward looking innovative ideas on improving the content, context and pedagogy of education.

In order to boost teaching and learning in the emerging themes of science and technology, teachers need continuous encouragement and assistance to improve their competence in relevant subject areas. Two types of training of teachers, in India and abroad, are considered: (i) relatively of longer duration (3 to 6 months) in priority theme areas and (ii) continuing life-long learning in the form of refresher courses of shorter duration (20 to 30 days) in educational technology and the subject domain of a teacher's expertise.

**2.7.2.1.1.1. Foreign Training:** Fifteen hundred faculty members will be trained in best institutions in the world in different frontier areas. These will include four persons from each Center of Excellence to be established in different universities (total 200 persons) for up to six months, 1100 persons in new and cutting-edge areas for up to six months, and senior officers' study visit (200 persons) for 2 to 4 weeks.

**2.7.2.1.1.2. National Training:**

**2.7.2.1.1.2.1. Orientation Programmes for newly recruited faculty in AUs:** Fifty programmes in five years, each of 21 days duration with 40 participants in each programme (through out-sourcing) to be organized.

**2.7.2.1.1.2.2. Programmes for Faculty training in specific areas:** Training of faculty of all AUs in specific areas particularly in the new courses introduced in the curriculum and emerging areas/disciplines, will be arranged at the institutions having expertise in those areas.

**2.7.2.1.1.2.3. Faculty recognition and awards including Young Faculty awards:** To motivate the faculty and enhance their esteem for being part of agricultural education system, necessary awards and recognition systems will be introduced in all AUs.

**2.7.2.1.1.2.4. International Faculty visit for capacity building in Indian AUs:** Accomplished professors and researchers from USA or such other countries would be invited to Indian AUs for varying period of time in specific areas such as functional genomics in plants and animals, bioinformatics, nanotechnology, conservation agriculture, diagnosis and vaccines, climate change and management in agriculture, novel methods of food processing and packaging, food safety and quality assurance. This would lead to capacity development of a large number of faculty and students and also result in formulation and initiation of research programmes in frontier areas.

**2.7.2.1.1.2.5. Attracting Talent to NARS:** A new initiative of having Agricultural Scientist Pool (100 nos.) for attracting Indian nationals with proven track record and studying/working abroad to help capacity building in National Agricultural Research System in new emerging areas.

**2.7.2.1.1.3. Faculty/PG students participation in International Conferences/Symposia abroad:** Due to financial constraints and lack of motivation, presently there is very little exposure of faculty to the international developments in agricultural sciences. It is envisaged that faculty will be supported with travel grant participation for making oral presentation. Rs. 10.00 lakh every year will be provided to each AU.

#### **2.7.2.1.2. Students Development**

**2.7.2.1.2.1. Master's students sandwich/exchange programme in India:** One hundred students per year for five years (total 500) to be facilitated @ 2.00 lakh each covering cost for 6 months.

**2.7.2.1.2.2. PhD Sandwich Programme with foreign universities/national R&Ds institutions:** Fifty students overseas and 50 students nationally each year (Total 500 students) for maximum of two years to be supported.

**2.7.2.1.2.3. Post-doctoral fellowships abroad in new and emerging areas:** The scheme is to provide the young and brilliant fresh PhDs/budding faculty an opportunity to gain vital research and teaching experience as post-docs before getting inducted through formal selection process. Fifty students per year for 5 years (total 250) will be supported @ 20.00 lakh each, for six months to one year research in new and emerging areas.

**2.7.2.1.2.4. National Post-doctoral fellowships:** In order to strengthen research and degree programmes in the emerging and frontier areas of science and technology, two hundred students per year will be awarded the fellowship of Rs. 35,000/- per month and contingency grant of Rs. 5.00 lakh per annum including Rs. 1.00 lakh for foreign visit. Awardees to be involved partly in teaching for which a certificate will be awarded. Some fellowships be earmarked for: biotechnology, bioinformatics, food technology, climate change, post-harvest management, zoonotic diseases, farm machinery, conservation agriculture, bio-fertilizers, extension methodology etc.

**2.7.2.1.2.5. University fellowship for PG programmes for top two students of each faculty:** Rs. 5000.00 per month per student to the top two students of each faculty in the AUs. provided there are minimum 10 enrollment otherwise one.

**2.7.2.1.2.6. UG Students Exposure visit to International Agriculture:** 100 per year, for 5 years, total 500 students, for average two weeks.

**2.7.2.1.2.7. International Internship Programme for UG students:** 100 per year, for 5 years, total 500 students, for 6 to 12 weeks, travel plus US \$1500 per month.

**2.7.2.1.2.8. Hands-on Training and Entrepreneurship Development of UG Students at Successful Small and Medium Agro-Entrepreneur Centers:** 50 such centers to be identified and 20 students to be sent every year to each center

making a total 1000 students sent for training every year. Duration will be for up to three months, and the support will be to center @ Rs. 2.00 lakh per year (Total 10.00 lakh in 5 years) and student @ Rs. 5000.00 for upto 3 months.

**2.7.2.1.2.9. Communication and Personality Development Programme:** To establish the infrastructure and facilities at 60 AUs, to be supported @ Rs. 1.00 crore each for five years.

#### **2.7.2.2. Curriculum and Instructional Material Development and Delivery**

**2.7.2.2.1. Restructuring and modernization of UG Programmes and development of integrated UG plus PG programmes:** Curriculum revision is a regular process in the ICAR and the UG curricula and syllabi in 2007 and PG curricula and syllabi in 2009 were revised. There is need for further revision or restructuring in view of new areas of studies, new system of education and to make them flexible, competitive, updated, innovative and demand driven.

**2.7.2.2.2. e- Content development:** Already, e-content development of UG course of Agriculture, Horticulture, Veterinary Science, Home Science, Dairy Technology and Fishery Science is in progress. It is proposed to take up e-content development of UG courses in Agrl. Engg. and Forestry, and PG courses in major subjects of Agriculture, Horticulture, Forestry, Fisheries, Veterinary Sc., Dairy Tech., Home Science, Agrl. Engineering.

**2.7.2.2.2. Development of Text Books & Instructional Material:** Emphasis will be on organization of Workshops for development of instructional material, content development for print and on-line, edited and books with joint partnership/authorship from India and abroad. Also, a massive drive will be undertaken for text book writing and a provision is made for 200 books, 2 in each discipline with Rs. 3.00 lakh each including honorarium.

#### **2.7.2.3. Establishment of Centers of Excellence in competitive mode**

Centers of Excellence (30-35 in number) will be developed in AUs in competitive mode in new and emerging areas identified and those who fulfill the minimum eligibility requirement of 10 faculty in discipline and demonstrated leadership in the area. The support will be Rs. 15.00 crore for 5 years per Centre for equipment, contractual Staff (RA/PDF), consultancy and training (both national and international), 5% grant for construction (not major but minor modifications, alteration, renovation, addition), and contingency for operational expenses up to 20% of budget.

#### **2.7.2.4. Establishment of Model Colleges for Rural Development Education**

Agricultural education concentrates mainly on agricultural development involving land based activities such as crop production and management, animal husbandry and fisheries. There is a need to shift from primary to

secondary agriculture and non land based activities so as to enhance livelihoods in the rural areas. This calls for reorienting agriculture education to include the components of rural development so that farmers can increase their opportunities for realizing higher income and employment. It is imperative that the education component should include agro based industries involved in processing, grading, packaging, transportation, storage and the whole set of activities relating to supply chain management. In the process, the focus should be to make farmer - producers as agri –entrepreneurs. This move towards non land based activities calls for skill development to meet the demand for agribusiness activities. Towards this end, establishment of Model Colleges imparting holistic education inclusive of agricultural and rural development in selected regions will be undertaken on pilot basis. Initially, three colleges to be established in SAUs covering hill, tribal, and backward regions by restructuring of the existing UG programmes for imparting technical education including entrepreneurship and skill development in various facets of rural development.

### **2.7.2.3. Increasing scope and effectiveness of net-working with educational institutions and research organizations**

#### **2.7.2.3.1. Forging New partnerships with Public and Private R&D institution and Research Assistantships**

Over the years, the level of public finances of the states to the agricultural universities has not been increasing in any significant manner and is far below the requirements of the universities in the context of contemporary needs of higher agricultural education. Even these amounts are mainly channelized towards meeting salary expenses and much of the development work is carried out through the funds provided by the ICAR. Models of public-private partnerships must be evolved for educational activities.

Linkages are required for improving the quality assurance mechanism and process, periodic revision of course curricula and syllabi, infrastructural capacity building, faculty exchange and development, internship of students, joint degree programmes, and extending or sponsoring education and research opportunities to the other/under developed countries. Also, for encouraging hands on training and experience in real life situations, brokering partnership with private business and industrial houses has become essential. Some private educational institutions have shown great potential in turning out better quality human resource.

Besides closer partnership in curriculum development with institutions including R&D organizations, and entrepreneurship skill development in final year of UG degree programme, joint PhD research will be encouraged in the ICAR research institutes, industry, general university or any other R&D Institution including IIT, IISc., IIM etc. by providing assistantship to students where the receiving institution is not able to provide support to the student. One hundred such assistantships per year for a maximum period of two years @ amount of PhD fellowship and contingency support will be provided.

#### **2.7.2.3.2. Faculty Movement/Exchange and linkages with public and private R&D institutions**

Capabilities of teachers will also be enhanced by encouraging movement through the Adjunct/Visiting faculty and sabbatical leave schemes. For this, institutions of repute like IIT, IIM, IISc., general universities and R&D institutions both in public and private sectors will be included.

2.7.2.3.2.1. **Adjunct Faculty:** Outstanding performing scientists/academicians from public and private R&D institutions, up to 10 per university per year in all the 60 AUs, will be supported. Provision for honorarium @ Rs. 3000/- per day limited to 30 days in a year plus TA and local hospitality will be made.

2.7.2.3.2.2. **Visiting Faculty/Sabbatical Leave:** One hundred scientists/faculty members per year, for 6 -12 months duration, Rs. 2000/- per day plus travel and local hospitality (free by institution) cost will be supported which will help the AUs in addressing the faculty shortage especially in new and emerging areas.

2.7.2.3.2.3. **Joint Educational programmes with general universities/IITs/Central Universities:** Faculty movement and exchange of benefits of experience and expertise in teaching and joint research guidance in critical and emerging areas will be facilitated under the project.

2.7.2.3.2.4. **Agripreneurs on Faculty:** There are several successful workers in private sector (agripreneurs, progressive farmers, producers etc.) with proven records. A mechanism to invite such agripreneurs and progressive farmers to deliver lectures or have interface with students and faculty for skill enhancement in specific areas is proposed.

2.7.2.3.2.5. **International Centers for Faculty Development:** In order to have faculty capacity development of SAARC, ASEAN and Afro-Asian countries and regional cooperation in agricultural education, International Centers for Faculty Development will be established at IARI, IVRI, CIFE and NAARM.

#### **2.7.2.4. Enhancing reach and effectiveness of agricultural education to farmers, rural women and agribusiness**

2.7.2.4.1. **Non-formal Education:** The practitioners of agriculture need continuous updated information on technology, policy, markets and various schemes and programs of the Government. In this direction, development of RLOs, capacity building for RLO content development, online and off line delivery of information involving regional stations and KVKs of the state agricultural Universities and the facilities developed under the National Knowledge Network will help to reach more number of practitioners. It is time that tailor made vocational programs are developed for the benefit of different stakeholders.

In order to empower the farmers, rural youth and farm women with knowledge on agriculture and allied sciences, Open and Distance learning (ODL) mode can be successfully utilized. Need based diplomas and certificate courses will be developed and implemented through ODL. Different stakeholders of agriculture such as farmers, trainers, development department officials, extension agents, input dealers, financial institutions and persons working in agribusiness sector can be targeted for the ODL by the SAUs. E-learning facilities at the universities would be augmented and the facilities developed under the National Knowledge Network and other such programmes of the central and state governments would be utilized.

## 2.8. Legal framework

This will be an integral part of a Centrally sponsored XII Plan scheme “Development and strengthening of higher agricultural education in India” implemented at the Education Division, ICAR, New Delhi.

## 2.9. Environmental impact assessment

Not applicable because of the nature of scheme.

## 2.10. On-going initiatives

The current ongoing programmes of the ICAR and their status is as follows are-

- **Accreditation of AUs:** The comprehensive Accreditation mechanism to regulate quality of agricultural education in the country was put in place in 1996. 36 agricultural universities stand accredited whereas several others are under consideration.
- **Niche Areas of Excellence:** Towards building excellence in specific strategic areas relevant to the region, a programme on “Niche areas of Excellence” was started during the end of X Plan. The elements of the programme include improving quality of human resource, providing adequate infrastructure, creating facilities for access to information, developing attitude and commitment of faculty/staff/students, facilitating interaction with the peer groups in India and abroad and sharing vision and system of well developed educational technology agencies. A total of 31 niche areas of excellence are presently functioning.
- **Experiential Learning:** For providing entrepreneurship, skill and confidence among graduates, experiential learning units in AUs have been established. These units have been very successful and are continuing to help in skill development and attitude building in undergraduate (UG) students and in linking the agricultural education with entrepreneurship development and professionalism. Project development including action plan development, production schedule and accounting form the corner stone of new initiative. A total of 341 Experiential Learning Units have established.

- **Revision of Course Curricula and Syllabi:** A major exercise was undertaken for the first time for **post-graduate course curricula and syllabi** in 95 subjects of agriculture and allied sciences and the revised curricula and syllabi implemented in all agricultural universities. The revised **under-graduate course curricula** as recommended by the IV Deans' Committee constituted by the ICAR has also been adopted by all the agricultural universities across the country. This is greatly helping in making higher agricultural education more utilitarian and relevant in tune with the scientific and technological advancements and the demands of the country's growing economy.
- **Modernization of AU Farms:** This new mega programme with a budget outlay of Rs. 421.95 crores for three years, was started in 2008-09 to provide a one time grant to all the State Agricultural Universities and Central Universities with Agriculture Faculty. This has led to enhancement of quality of education/training/research, promote excellence, and augment supply of research products (such as seed and bio-agents) with concomitant resource generation.
- **Human Resource Development:**
  - For promoting excellence and creating a culture of basic research at national level with freedom and flexibility, the Council has provided 10 positions of **National Professors** in the pay scale of the Vice Chancellor.
  - The Council supports development of strong centres of research and education around outstanding scientists by providing 25 positions of **National Fellows** in the pay scale of Professors.
  - In order to benefit from the outstanding superannuated scientists, 50 positions of **Emeritus Scientists** have been provided so as to utilize their talent in research and teaching.
  - Presently, 31 **Centers of Advanced Studies/Advanced Faculty Training (CAS/CAFT)** are running all over the country in various disciplines with appropriate funding support from the Council and, are regularly imparting advanced training to the faculty.
  - To provide continuing education and training in highly specialized subject to teaching faculty, about 100 **Summer/Winter Schools** (21 days) and short courses (10 days' duration) are organized every year in emerging, cutting edge areas with appropriate funding support from the Council. About 2400 scientists/faculty members are trained every year in the CAS/CAFT and the Summer/Winter Schools.
  - The Council also facilitates **participation of faculty in seminar, symposium, trainings and national dialogues** on important topical issues as related to agricultural R&D.
  - To support the faculty, provisions exist for **preparation of quality instructional material** for classroom teaching, textbook writing, manuals for

imparting practical knowledge and skills and e-resources in general for web-based teaching learning.

- Forty three Indian scientists/faculty members received training in USA under the **Indo-US Norman Borlaug Fellowships Programme** in the four identified priority areas of cooperation viz., (i) Human Resources and Institutional Capacity Building, (ii) Agri-Processing and Marketing, (iii) Emerging Technologies, and (iv) Natural Resource Management.
- Every year the ICAR conducts **All India Entrance Examinations** for filling up 15% UG seats in major 10 subjects and 25% PG seats in about 90 subjects. Besides admissions, National Talent Scholarships at UG level and 475 Junior Research Fellows for pursuing Master's degree programme are also awarded based on these examinations. The Council also undertakes annual examination for the award of 202 Senior Research Fellows for pursuing Ph.D. degree programmes in AUs. Fellowships are awarded to candidates taking admission in a university outside their state of domicile. This endeavour not only assures quality of students, it promotes national integration and healthy competition and reduces inbreeding.
- **ICAR International Fellowships:** The Council has, for the first time, initiated the programme in 2009-10, with the dual objectives: (i) facilitating education of Indian nationals in one of the best Universities abroad, and (ii) facilitating admission of foreign students in Indian agricultural universities to help demonstrate the strengths of the Indian agricultural system. 18 fellowships were awarded in 2009-10 and 2010-11 for studies abroad.
- **Norman Borlaug Chair in Biotechnology for Crop Improvement:** A chair of National Professor has been established with the objective of developing a centre of excellence in this field. This is also an appropriate tribute to Nobel laureate Prof. Norman E. Borlaug.
- **e-Learning in AUs:** ICAR has supported development of e-Learning modules in 6 disciplines at UG level under NAIP. This will be hosted online shortly and would benefit students immensely even in the face of shortage of faculty. Besides supporting infra-structure and ICT facilities in the AUs, ICAR has supported digitalization of the Ph.D. theses of all AUs through a project **Krishi Prabha**, and strengthening of digital library and management through a project **e-Granth**, and availability of electronic version of national and foreign journals to 124 centres under a project **Consortium for e-Resources in Agriculture (CeRA)**.
- **Admission to foreign students:** DARE/ICAR provides admission to foreign students on regular basis and over 250 foreign nationals of more than 20 countries admitted every year mainly from countries namely, Afghanistan, Bangladesh, Bhutan, Canada, Cambodia, Cote d'Ivoire, Egypt, Ethiopia, Fiji, Zambia, Iran, Iraq, Mozambique, Namibia, Nepal, Senegal, South Africa, Sudan, Sri Lanka, Syria, Tanzania, Vietnam, Yemen. Several AUs have also developed functional linkages/MoUs with Universities abroad. Council supports the AUs by providing need-based International Hostels.

Further, to support the agricultural **Human Resource Development in Africa** through formal education of African scientists/faculty and students in India, India has started (2010-11) to offer 75 fellowships each year for M.Sc. and Ph.D degree programmes in Agricultural allied sciences every year for four years. Similarly, to support agricultural **human resource development in Afghanistan**, India has offered 115 fellowships for M.Sc. and Ph.D degree programmes every year to the faculty members and fresh students for five years.

- **Financial support for Infrastructure building:** There are **century-old historical agricultural colleges** that needed support particularly for developing infrastructure and undertaking major refurbishing works. An outlay of Rs. 25 crores to each of the three old historical colleges namely Agriculture College, Nagpur, Agriculture College, Kanpur and Agriculture College, Sabour, is being provided during the current Plan. Further, **Educational Museums** are being developed in the AUs. Also, funding is being provided at the main university campus of five universities for developing **Regional Sports Complex** which have sports centers with existing infrastructure and resource to host sports fest. Other universities are also being supported for sports related provisions.

Although the Council has already provided about 60 **girls' hostels** in the past, number of girl students is increasing rapidly to outflow these hostels. Therefore, upto 2 girls' hostels to each AU (total 63) have been provided in XI Plan along with other girls-related amenities. These still fall short of requirement in view of increased enrollment of girl students.

- **Promoting Extended Faculty:** The Council promoted the strengthening of the present collaboration and partnership by mooted the concept of extended faculty nationally and globally so that existing faculty of any AU could be supplemented and the benefit be derived from teachers/experts available outside the AU. Council has provided specific catalytic support for faculty exchange and also for facilitating (i) guest lectures, (ii) guest faculty, and (iii) adjunct faculty, however, most AUs could not implement it due to shortage of funds.

## 2.11. Technology issues

Not applicable as the project's focus is on educational improvements.

## 2.12. Management arrangements

### 2.12.1. Project Management and Implementation

The Project management control will rest with the Secretary DARE and DG ICAR. Coordination and facilitation of project activities will be located in the Education Division with DDG Education as the National Coordinator of the Project. For overall implementation and periodic monitoring and evaluation, a Project Director will be appointed through selection/deployment who will be assisted by the four National Coordinators. A Project Monitoring Committee

and Project Implementation Unit will be set up. While Secretary, DARE and DG ICAR will head PMC, PIU will be steered by DDG Education. Details on other support staff will be worked out separately and appropriate budgetary provisions will be made to cover the establishment cost and other charges. Each of the participating SAU and DU will set up a Project Cell. While the overall control of the project components will rest with the VC/Director, activities of Project Cells will be managed by an identified Nodal Officer.

### **2.12.2. Selection criteria for SAU/DUs**

The project envisages improving the quality of agricultural education in the country which is imparted primarily by SAUs, CAU, DUs, and CUs with Agriculture faculty, These will be the natural partners in the project. The systemic reforms will be across all AUs while the institutional development activities will be limited to 50% of AUs based on the selection criteria and guidelines. While all the four ICAR DUs (IARI, IVRI, NDRI and CIFE) will be included for participation, a minimum selection criterion will be imposed to identify the SAUs. Only those SAUs and CUs, which conform to or agree to conform to the following conditions will be included:

- i. Have assured grant for salary and other establishment charges including State government's commitment for a minimum of 15% of establishment charges as non-salary support, and smooth flow of funds on a timely quarterly basis.
- ii. Have been Accredited by ICAR and implemented suggestions for improvement of education and research.
- iii. Adhere to the ICAR Model Act (2009).
- iv. Enjoy administrative/financial autonomy.
- v. Commit to introduce suggested academic, financial, organization and management reforms and their continuance after termination of the project.
- vi. Follow agreed fund utilization guidelines and purchase procedures.
- vii. Meet norms and standards for starting new college and programme as specified by the Accreditation Board.
- viii. Have faculty as per the norms set by ICAR for the discipline in which support requested.

### **2.12.3. Mechanism for procurement of goods/works**

Procurement will be done at the ICAR headquarters/ICAR DUs/ SAUs/ ICAR resource institutes by following the agreed World Bank guidelines. These institutions have direct experience of procuring goods within the country and from abroad. All institutions have the capacity to get done small civil works themselves, and larger works using the services of PWDs. Procurement capacity, if necessary, will be built through organizing training and guidance by a procurement consultant. It is proposed to hire services of procurement consultant/ specialists at the central level for providing training and guidance in Bank procurement methods to various institutions/ SAUs. All banks finance

works and goods will be procured using the “Guidelines for procurement under IBRD Loans and IDA Credits”.

#### **2.12.4. Accounts and Audit**

The Department of Agricultural Research and Education of the Ministry of Agriculture (DARE), ICAR(ED), the agricultural universities would establish separate accounts for the project. These accounts, together with supporting documentation, including evidence of contributions from IDA, would provide a comprehensive record of project financing and expenditures. These accounts and the Special Account will be maintained and audited annually according to appropriate auditing principles consistently applied by independent auditors acceptable to ID, and that the auditor’s report, which will include a separate statement on SOEs and certified copies of project accounts, will be submitted to IDA not later than nine months after the close of each fiscal year by the Department of Agricultural Research (DARE) for the whole project.

#### **2.13. Means of Finance and Project Budget**

The Project will be integral component of the on-going central sector scheme “Development and strengthening of higher agricultural education in India” during the XII Plan (2012-17) at the Education Division, Indian Council of Agricultural Research, New Delhi. The project is proposed on 50:50 cost sharing basis between the World Bank and the ongoing central scheme following the guidelines of the Department of Economic Affairs, Ministry of Finance of Government of India. In the main scheme the various on-going activities such as support for policy, common academic regulations, updated and contemporary course curricula and delivery systems, improvement of faculty competence, promoting excellence through scholarships/fellowships, Niche areas of excellence, experiential learning, National Professors, National Fellows, Emeritus Scientists, admissions of students through All India competitions, modernization of farms, IT support and up-gradation of infrastructure and facilities including libraries, etc. shall be continued, and strengthened. The NAEP aims at bringing systemic reforms and innovative institutional developments in a fast track mode, for enhancing and sustaining the quality and relevance of higher agricultural education in the country and the efforts will be synergistic to the ongoing central sector scheme.

The Project meets the Finance-Plus criteria of the Department of Economic Affairs, Govt. Of India for selection of the projects to be posed to the World Bank. It aims at re-orienting and re-engineering the higher agricultural education, a strong component of capacity building/institution building for long term sustainable gains, improvement of services by the agricultural universities, and innovative approaches for enhancing and sustaining the quality and relevance of higher agricultural education in the country.

In order to address the challenges and harness the opportunities, the reoriented Agricultural Education agenda will need adequate financial support. Following major items for funding are necessary:

### Sectoral Reforms

- Reforms in governance of AUs and increasing system's internal efficiency through e-governance, financial management system and the Project Implementation and Monitoring Unit at Education Division, ICAR.
- Strengthening of Accreditation Board and compliance with quality assurance policies and mechanisms in ICAR and AUs. Developing policies for development of higher agricultural education system.
- Human resource need assessment and strategic planning for its utilization.
- Attracting young talent to agricultural education through ASPIRE scheme. human resource need assessment,

### Institutional Development

- Promotion of academic excellence in critical/emerging areas through faculty and students development programmes in India and abroad.
- Curriculum and instructional material development and delivery
- Subject specific infrastructure development for enhancing quality of PG research.
- Establishment of centers of excellence, model colleges for rural development, education.
- Networking and linkages with public and private R&D institutions, faculty movement/exchange.
- Enhancing reach and effectiveness of agricultural education to farmers, rural women and agri-business through non-formal education.

The estimated cost for various project activities is around US\$ 300 million. The details are as follows.

(Rs. in Crores)			
S. No	Activity	Budget	
<b>• Systemic Reforms</b>			
1.	Reforms in Governance of AUs and increasing System's internal efficiency		
	• Financial Management System	10.00	
	• E-Governance in AUs	20.00	
	• Project Implementation Unit at Edu. Division (Rs. 7.00 crore/year)	35.00	
	<b>Total</b>		<b>65.00</b>

2.	Strengthening of and Compliance with Quality Assurance Policies and Mechanisms <ul style="list-style-type: none"> <li>• Accreditation Board</li> <li>• Quality Assurance Cells in AUs (Rs. 20 lakh X 60 AUs)</li> </ul> <p style="text-align: right;"><b>Total</b></p>	5.00 6.00	<b>11.00</b>
3.	Agriculture Sciences Pursuit for Inspired Research Excellence (ASPIRE) to attract young talent to agricultural education.		<b>250.00</b>
4.	<ul style="list-style-type: none"> <li>• Human Resource Need Assessment– Strategic Planning for 2030</li> </ul> <p style="text-align: right;"><b>Total</b></p>	5.00	<b>5.00</b>
<b>• Institution Development</b>			
1.	Promotion of academic excellence in critical/emerging areas		
	<b>a) Faculty Development</b> i) Foreign Training: 200.00 ii) National Training: <ul style="list-style-type: none"> <li>• Orientation Programmes for newly recruited faculty in AUs 5.00</li> <li>• Programmes for Faculty training in specific areas 15.00</li> <li>• Faculty recognition and awards including Young Faculty awards 2.00</li> </ul> iii) International Faculty visit for capacity building in Indian AUs 25.00 iv) Attracting Talent to NARS 15.00 v) Faculty/PG students participation in International Conferences/ Symposia abroad 20.00 282.00 <p style="text-align: right;">Total (a)</p> <b>b) Students Development</b> <ul style="list-style-type: none"> <li>• University fellowships for PG programme for top two students of each faculty (Rs. 5000/pm/student) 15.00</li> <li>• Master's students sandwich/exchange programme in India (500 students X Rs. 2.00 lakh each) 10.00</li> <li>• PhD Sandwich Programme with foreign universities/national R&amp;Ds institutions 30.00</li> <li>• Post-doctoral fellowships abroad in new and emerging areas (100 students X Rs. 20.00 lakh each) 20.00</li> <li>• National Post-doctoral fellowships 100.00</li> <li>• Teaching Assistantships 20.00</li> <li>• Teaching Associateships 10.00</li> <li>• UG Students Exposure visit to International Agriculture 5.00</li> <li>• International Internship Programme for UG students 5.00</li> <li>• Hands-on Training and Entrepreneurship Development of UG Students at Successful Small and Medium Agro-Entrepreneur Centers 30.00</li> <li>• Communication and Personality Development Programme (60 AUs X Rs. 0.5 crore each for 5 years) 270.00</li> </ul> <p style="text-align: right;">Total(b)</p> <b>c) Curriculum and Instructional Material Development and Delivery</b> <ul style="list-style-type: none"> <li>• Curriculum development budget outlay 1.00</li> <li>• E-content development for UG courses in Agrl. Engg. &amp; Forestry 5.00</li> <li>• E-content development for PG courses in major subjects of 25.00</li> </ul>		

	Agriculture, Horticulture, Forestry, Fisheries, Veterinary Sc., Dairy Tech., Home Science, Agrl. Engg.	2.00	
	<ul style="list-style-type: none"> <li>Workshops, content development for print and on-line, edited books with joint partnership/authorship from India and abroad</li> </ul>	5.00	
	<ul style="list-style-type: none"> <li>Text Book Writing 200 books, 2 in each discipline, Rs. 3.00 lakh each including honorarium</li> </ul>	38.00	
	Total(c)		
	d) Establishment of Centers of Excellence in competitive mode (30-35 X Rs. 15.00 crore each)	500.00	
	<b>Total</b>		<b>1090.00</b>
2.	Establishment of Model Colleges for Rural Development Education <ul style="list-style-type: none"> <li>Three colleges to be established in SAUs covering hill, tribal, and backward regions by restructuring of the existing UG programmes for imparting technical education including entrepreneurship and skill development in various facets of rural development.</li> </ul>	45.00	
	<b>Total</b>		<b>45.00</b>
3.	Increasing scope and effectiveness of net-working with educational institutions and research organizations <ol style="list-style-type: none"> <li>Forging New partnerships with Public and Private R&amp;D institution (100 Assistantships per year)</li> <li>Faculty Movement/Exchange and linkages with public and private R&amp;D institutions <ul style="list-style-type: none"> <li>Adjunct Faculty</li> <li>Visiting Faculty/Sabbatical</li> <li>Joint Educational programmes with general universities/ IITs/Central Universities</li> <li>Agripreneurs on Faculty</li> <li>Establishment of International Centres for Faculty Development</li> </ul> </li> </ol>	10.00	
		20.00	
		10.00	
		5.00	
		1.00	
		8.00	
	<b>Total</b>		<b>54.00</b>
4.	Enhancing reach and effectiveness of agricultural education to farmers, rural women and agribusiness <ul style="list-style-type: none"> <li>Non-formal education: general Guidelines, curriculum, strategic implementation support</li> </ul>	30.00	
	<b>Total</b>		<b>30.00</b>
	<b>Total Budget</b>		<b>1550.00</b>

**2.14. Time frame** 2012-2017

**2.15. Risk Analysis** Nil

**2.16. Evaluation**

The primary responsibility of programme monitoring will rest with the participating SAUs/DUs and at the Project level with PIU in Education Division,

ICAR. The basis for monitoring will be the programme activity plans against a set of predefined indicators. While the Project Cells will undertake regular priority setting, monitoring and evaluation, periodic progress assessment of institutional programmes will be made by the respective Institute Management committees/Institute Project Management Committee. At PIU level, there shall be a Steering Committee and Project Monitoring Committee. Based upon the monitoring and reports received from the SAUs/DUs, PIU will assess the progress through visits and by commissioning external reviews to keep track of quality, efficiency, reforms and performance audits. In addition there would be annual/biannual reviews jointly by ICAR/DARE and World Bank.

### **2.17. Success criteria**

Project envisages building capacity of SAUs/DUs in that education and training can help in reducing problems of poverty, unemployment, falling productivity, growing natural resource degradation, globalization and free economies and falling investments in science and technology. The anticipated benefits of the project are as follows:

- More engagement in off-farm jobs
- Decreased unemployment rate and increased earning of graduates
- Enhanced skills and entrepreneurship and communication abilities among graduates.
- Increased demand for setting up of small enterprises, agri-businesses and agri-clinics
- Increased linkages and partnerships among public sector institutes and among public and private sector institutes/organizations
- Increase in admissions of foreign students
- Increase in the demand for consultancy services
- Increase in internal resource generation
- Increased access to information
- Enhanced quality of higher education - academic excellence
- Gender relevance and quality
- Faculty updation and involvement/e-Education (IT)
- Increased research output and quality

### **2.18. Financial and economic analysis**

The Project will be integral component of the on-going central sector scheme “Development and strengthening of higher agricultural education in India” during the XII Plan (2012-17) at the Education Division, Indian Council of Agricultural Research, New Delhi. The cost of the Project will be shared on 50% basis between the World Bank support and the funds made available by the Govt. of India through the above mentioned scheme.

### **2.19. Sustainability**

So that agricultural education continues to remain relevant and useful to all stakeholders and levels of performance and improvements in quality of teaching and learning reached during the project period are sustained, it will be essential to ensure adequate funding once the project assistance concludes in 2017. Because of: (i) agreed arrangements with the States, the universities will continue to receive block grants to cover establishment costs, (ii) ICAR will continue to provide development and strengthening grants to pay for the running costs and (iii) name and fame earned in the field of quality of agricultural education will enable SAUs/DUs to generate significant resources internally to maintain quality of teaching and health of working environs and infrastructure. Also States will be approached to allocate at least 1% of the Market Cess collected by them from sale of agricultural produce. With all these arrangements, project activities will be sustained with vigor and sense of commitment.

## **2.20. Epilogue**

Improving quality of agricultural education holds the key to propelling not only agricultural growth but also developing technologies for sustainable agriculture leading to livelihood and nutritional security. The attempts made by the ICAR over last two decades through its various schemes, have led to considerable improvement in the quality of higher agricultural education and skills of students but there have been several factors, beyond the control of ICAR, that have adversely affected the improvements in quality of education in some of the areas. Some major factors have been lack of attraction of talented rural and urban youth towards higher agricultural education, shortage of faculty and lack of motivation to them, and inadequate funding support to educational institutions. In the present project proposal, innovative ways have been articulated to address key concerns that fall within the domains of ICAR regulatory power given as per Cabinet decision of 1973. The agricultural education continues to be a State subject and therefore, major effort will also be required by the States. In order to get cooperation and involvement of States, innovations have been built in design for attracting investments at the State level. The key initiatives include ASPIRE programme for attracting young talent to agricultural education, major reforms in governance for bringing efficiency in the system, embedding new system for attracting and retaining talented faculty, continued emphasis on capacity building through quality improvement programmes nationally and internationally, developing public- private partnership for curriculum delivery and educational research, partnership with foreign universities for sandwich programme, development of joint projects with the scheme of post-doctoral fellowships and, inviting international faculty for capacity building, performance linked support, development of priority setting and monitoring and evaluation cells in the institutions and acceptance to implementing reforms for enhancing efficiency in governance as a precondition for partnership. Another thrust area of the project is the development of Centers of Excellence in competitive mode to bring quality improvements across different regions and promote new ways to technology development. Non-formal education with the objective of reaching the unreached for tapping the agricultural potential in disadvantaged regions is another new initiative. Model extension outreach through ICT will trigger technology

dissemination revolution and bridge the technology gap for enhancing productivity in most neglected regions. The models developed under the project will ultimately lead to horizontal spread of technologies by State governments.

With the implementation of the project, the new breed of students will have analytical and professional skills, knowledge in new emerging areas, entrepreneurship skills and confidence to start an enterprise and, capable of addressing new and emerging challenges of agriculture in the globalized scenario. In addition, the major initiatives contemplated for enhancement of quality of post-graduate research, will also ultimately help in developing much needed technologies for meeting the challenges of climate change, rational input use, and enhancing productivity and profitability through use of new technologies such as biotechnology, nanotechnology, precision agriculture, etc.

Since the major objective of the project is to have quality education including skills and entrepreneurship development through various incentives and approaches, talented students will be attracted to agricultural education. The faculty in universities/colleges will be augmented, their competence improved and they will be enthused and motivated for better performance. A globally competitive state-of-the-art infrastructure will be created in the priority area in each university, and this enable substantial improvement in over-all teaching-learning and research environment and technology development. Also, capacity development on large scale, taking advantage of development in ICT, ODL for non-formal education will usher in new era for taking benefits of technology to beneficiary.. Based on future manpower need assessment & planning, the human resource needs of emerging sectors will be addressed. The efficiency of the whole system will take a leap as a result of e-governance and other systemic reforms envisaged.. All this will result into producing new breed of graduates and Post-graduates who are equipped with new tools and technologies to address new challenges of agriculture and usher in prosperity and propel agricultural growth.