

Full Speech of Dr. Mangla Rai, Secretary (DARE) & Director General, ICAR on the 79th Annual General Meeting

Hon'ble President of the ICAR Society, Shri Sharad Pawar Ji, Hon'ble Minister of State for Planning, Shri M.V. Rajashekharan ji, Hon'ble Ministers from States, distinguished members of the ICAR Society and Governing Body, colleagues from the Council, representatives of Press and Media, Ladies and Gentlemen!

I deem it to be a matter of privilege and pleasure to welcome Shri Sharad Pawar Ji, the President, and all the distinguished members of the ICAR Society, to the 79th Annual General Meeting. I wish to express my sincere gratitude to the President of the Society for his continued guidance, direction, and dynamic leadership to the National Agricultural Research System. We thank the Hon'ble Ministers of Agriculture/Horticulture/Animal Husbandry/Fisheries from various States and other members of the ICAR Society, who have continuously provided valuable suggestions and support that have enabled successful implementation of various policies and programmes of the Council. We are extremely thankful to the representatives of the Press and Media for giving wide coverage to highlight various activities of the ICAR. I, on my personal behalf, and behalf of the Council, wish to avail this opportunity to extend a warm welcome to each one of you. It is for the first time that the AGM of the ICAR is being organized as early as in the month of January. In this context, I am happy to share with you that the audited annual account and audit report have been received within seven months after close of financial year instead of 14-15 months taken in the past.

The year 2006-07 augured well for Indian agriculture, and the country recorded an all-time high production of foodgrains, sugarcane and cotton. Horticulture, livestock and fisheries sectors also recorded impressive performance. Also, the kharif production in 2007-08 is estimated to be 112.24 million tonnes. The Planning Commission has approved a total plan outlay for XI Five- Year Plan of DARE/ICAR at Rs 12,023 crore, which is more than double the X Plan outlay (Rs 5,368 crore). The enhanced outlay would help boost institutional capacity in human resource and infrastructural resource to generate cuttingedge technologies.

The slowdown in rate of growth in agriculture sector is a national concern, and technological backstopping is imperative to increase velocity of agricultural growth. Recent initiatives have started paying dividends with agricultural growth of about 4%. The ICAR has prepared a document on State Specific Technological Interventions to address location-specific technology dissemination, which is appropriately being used. In pursuance of the decisions taken in the 2nd Meeting of the NDC Sub-Committee on Agriculture and Related Issues, a Sub-Group on Adoption and Generation of Relevant

Technologies and their Dissemination to Farmers has been constituted. After in-depth discussions, the ICAR was assigned the responsibility of preparing the report. The document was submitted to Planning Commission with focus on drawing action plans for generation and adoption of advanced crop production technologies such as biotechnology including transgenics, bioinformatics and eco-friendly technologies using genetic/genomic research including conservation of genetic resources, and to work out and strengthen extension machinery for dissemination of technology and knowledge with particular reference to outreach programmes of the ICAR and SAUs.

While indicating the kind of future research along with commensurate infrastructure and investments required, the report also mentions about some of the ready-to-use technologies with potential of enhancing agricultural production and profitability. The project on quality seed production of agricultural crops and fisheries has paid rich dividends as the production of quality seed, saplings and fingerlings has more than doubled within a year of its launch. In the ongoing year, there is every indication that it would further double in most of the cases. Water for use in agriculture is fast becoming a critical limiting factor. Realizing the need to address this vital component of sustainable agriculture, a special corpus fund amounting to Rs 96 crore has been earmarked to impart training and conduct demonstrations for trainers and farmers in 32 institutions for water management. Also in December 2007 for Intellectual Property portfolio management, provision of Rs 48.60 crore has been made for the first time in the Council. Global climate change is now a reality. There has been steady increase in atmospheric concentrations of carbon-dioxide, methane and nitrous oxide, greenhouse gases (GHGs), mainly on account of human activities. Increase in carbon-dioxide concentration is primarily due to fossil fuel use and land-use change, and those of methane and nitrous oxide due to agricultural activities.

The increase in GHGs has resulted in warming of climate by 0.74°C between 1906 and 2005. Eleven of the last twelve years (1995-2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850). The Intergovernmental Panel on Climate Change (IPCC) has projected that temperature increase by the end of this century is likely to be in the range of 1.8 to 4.0°C. It is also likely that future tropical cyclones will become more intense. Himalayan glaciers and snow cover are projected to contract. The projected sea level rise by the end of this century is likely to be 0.18 to 0.59 metres. Analyses done by the Indian Meteorologists also generally show same trends for temperature, heat waves, glaciers, droughts and floods, and sea level rise as by the IPCC, although the magnitude of the change varies. Such global climatic changes will affect agriculture through their direct and indirect effects on crops, soils, livestock and pests.

The ICAR has taken a two-pronged approach to boost basic/strategic research in frontier areas of agricultural sciences, so that scientific base for technology development in agriculture is strong and permanent. The first approach is through the National Agricultural Innovation Project under which an important component is for basic and strategic researches with a budget outlay of about Rs 222 crore. Under this in a set of thrust areas identified through a nationwide discussion, projects, which address a large basic/strategic research problem with an end-to-end approach, are awarded to consortia of competent institutions through open-nationwide competition. So far, 11 projects with an outlay of Rs 62.34 crore have been approved. The second approach is through the National Fund for Basic and Strategic Researches in Agriculture in which very broad areas have been identified, and the projects are awarded for smaller problems through a nationwide competition that is scientist-based rather than institution-based; in this 21 projects have been approved with an outlay of Rs 26.46 crore. These two approaches are complementary to each other. These projects address problems in areas like hybrid seed production, resistance to biotic and abiotic stresses of plants like cotton, rice, oilseeds (groundnut, sesame, mustard) , pulses (field pea, chickpea), tuber crops, cucurbits stone fruits, and animals like cattle, buffalo and fish, increasing reproductive efficiency of animals like buffalo, increasing nutrient-use efficiency of animals and plants and addressing problems like food-chain contaminated by arsenic, post-harvest technology and agricultural biomass based energy.

These projects use the latest in the technologies including biotechnology, sensors, GIS, and material physics and engineering. Very encouragingly all competent institutions whether agricultural or others like, IITs, IISc, CSIR, BITS, Pilani, CCMB, Indian Rubber Manufacturers Research Association and ICGEB are now partners in basic/strategic research in agricultural sciences. An annual financial support of Rs 388 crore was given to Agricultural Universities for modernization and strengthening of academic facilities and updating infrastructure and faculty improvement. This one year support was more than provided in the entire X Plan period. For strengthening human resource development programme in the North-east region of the country, a new College of Post-graduate studies was established during the year at Barapani in Meghalaya and one on post-harvest management was made operational at Sikkim under the Central Agricultural University.

During the year, seven patents were granted, and 53 patents and 272 Plant Variety Protection applications were filed. Inductions of young, talented and enthusiastic minds form the lifeline for any research organization to remain relevant and vibrant. The Council appointed 493 scientists both at the entry and the senior levels during the year. For most of the research management positions we are able to complete the recruitment and selection process even prior to incumbent demitting office. As a result of proactive measures initiated at the Council for ensuring regular appointments, the average time

taken for processing ASRB recommendations has been drastically reduced to about three days as against several weeks to months in the past. A detailed report of the DARE/ICAR activities is already placed in your folder. This year we have presented the activities and achievements in thematic mode instead of the usual divisional mode. However, I take this opportunity to share with you some of the salient achievements in the field of agricultural research, education, extension as well as some of the O&M initiatives to further enhance the system's efficiency.

Soil and water productivity

Soil resource maps were digitized and developed for Karnataka and Andhra Pradesh. A rapid biological field kit has been developed to assess decomposability of farm-waste during composting. System of Rice Intensification has been found enhancing land, water and crop productivity and also saving on labour input. For reclamation of saline-sodic soils, a horizontal flushing technique has been proposed, which substantially reduces gypsum requirement substantially. Integrated farming systems combining agriculture, livestock, fisheries and aquaculture and a host of agri-enterprises with enhanced productivity, profitability and livelihoods have been demonstrated. A highly remunerative cropping system involving plantation of drumstick with greengram-fennel has been suggested in place of tobacco monocropping for reclaimed Mahi ravines.

Genetic resources

Collection, conservation and evaluation of plants, animal, fish and microbial genetic resources is one of the important activities for their further improvement. In plants, a total of 2,200 cultivated and wild germplasm collected from 21 states have been characterized, about 25,000 accessions have been evaluated and over 16,800 plant genetic resources conserved in the National Gene Bank. Besides, salvaged 96.64% of the infected/infested exotic accessions have been processed for quarantine clearance. More than 365 exotic germplasm of *Gossypium hirsutum* could be acquired from the USA, China, Pakistan and Iran. Germplasm (49) with unique traits in cereals, millets, pulses, oilseeds, fibre crops and forages, vegetables, tubers, ornamentals, medicinal and aromatic plants have been registered; 190 accessions of important fruit crops are added to genetic resources. More than 650 strains of different fruits grown in arid regions have been collected. In vegetables 2,000 germplasm lines have been collected and conserved.

Tissue accessions (1,200) and 550 DNA sequences of freshwater and marine fish species have been added to the NBFGR repository. DNA repository of sheep breeds Ganjam, Kendrapara, Deccani, Nellore, Nali, Magra, Chokla, Garole, Patanwari, Marwari, Kheri, Malpura, Muzaffarnagri, Jaisalmeri and Sonadi has been established. The cDNA of uterine milk protein (UTMP) and genome sequence (>4 kb) of ghrelin gene of buffalo has been cloned and characterized. Nearly 3.2 lakh insects and mites were collected through field surveys in 27 states/union territories in 165 districts, and over 2,500 cultures of isolated filamentous fungi, bacteria, actinomycetes and yeasts from soil, plants and insects have been maintained in repository. Twenty different groups of

Bacillus in Indo-Gangetic plains, based on 16S rDNA-RFLP analysis, have been identified.

Plant Improvement

Ninety-six varieties/hybrids of major food crops including rice, wheat, barley, triticale, maize, pearl millet, pulses and oilseeds have been released/ identified for different agroclimatic regions of the country. Development of marker-assisted selection-based Improved Pusa Basmati 1, having all the qualities of basmati rice and also resistant to bacterial blight; CMS-based pigeonpea hybrid GTH 1 for Gujarat; sunflower hybrid (DRSH 1) for rabi-summer; soybean variety Pratap Soya 2 for all the northeastern states and Karnataka, Tamil Nadu and parts of Maharashtra and TAMS 98-21 for Vidharbha region of Maharashtra; high-yielding white-seeded sesame variety TKG 306 for Madhya Pradesh; linseed varieties, Kartika and RLU 6 for Chhattisgarh and Rajasthan respectively; six sugarcane varieties having higher yield and better-quality characters for commercial cultivation; maize cultivar Vivek 27 for Bihar, West Bengal, Orissa, Jharkhand, Andhra Pradesh, Maharashtra, Karnataka, Tamil Nadu, and Vivek 25 for Himachal Pradesh, Uttarakhand, Jammu and Kashmir, North-eastern region; Guinea-grass JHGG 04-1 for semi-arid condition; Indira Sona (hybrid of rice) with good grain and cooking quality for irrigated conditions of Chhattisgarh; and mesta variety Madhuri for roselle-growing tract, in these some are value-added varieties, are significant achievements in crop improvement research .

The improved horticultural varieties/hybrids for higher productivity are: Thar Sevika hybrid of ber showing early maturity and high yield with excellent fruits, red-coloured guava selection, CISH-G 1, found promising for long shelf-life; Goma Aishwarya, a prolific bearer aonla, matures earlier than NA 7; and MP/ 98-71 and Kufri Himsona potato are processing varieties, found suitable for Frenchfries. Kashi Unnati and Kashi Kanchan, photo-insensitive varieties having high tolerance to golden mosaic virus and Pseudocercospora cruenta disease are suitable for growing in spring-summer and rainy seasons. Onion Bhima Raj is suitable for kharif in Maharashtra, Karnataka, Gujarat and for rabi in Rajasthan, Gujarat, Haryana and Delhi. Black pepper hybrids IISR Garmunda and IISR Malabar and turmeric varieties LAP Supreme and IISR Kedaram have been released for commercial cultivation.

A new genetic linkage map of sorghum and quality trait loci for shoot fly and terminal drought resistance has been developed. Cytoplasmic male sterility (CMS) system has been prepared in safflower. Indigenously synthesized genes Cry 1F and Cry 1Aa3 could be transferred in desi cotton varieties and in American cotton variety. Identification of pomelo with thin rind and pink pulp; cloning of anti-microbial peptide gene and formation of transformants in Ney Poovan and Rasthali banana; transformation in tomato plants with DREB-1 gene for tolerance to moisture stress; development of breeding line for bacterial resistance in pomegranate; development of a transgenic watermelon with complete resistance to WBNV; development of heat-tolerant lines in tomato, capsicum,

peas and Frenchbean, and identification of donor sources of resistance to leaf curl virus in chillies (GKC 29, BS 35 and EC 49763) are new research innovations.

Livestock improvement

Six pure lines of White Leghorn have been improved through intrapopulation selection. In S-23 generation, fertility and hatching ability improved and remained above 95% in both lines. The phenotypic response to egg production up to 64 weeks of age was 3.2 and 6.8 eggs/generation in IWN and IWP, and the corresponding genetic response was 8.3 and 4.7 eggs/ generation, respectively, over the last 5 generations. Naked neck and dwarf were used for improvement of gene lines for utilization in tropical poultry production. Biotechnological interventions were used for faster multiplication of superior germplasm of buffalo.

Partial complementary DNAs were cloned from liver of 5 species in 4 genera of Indian carps, and a phylogenetic tree of amino acid sequences of transferring cDNAs from carps was also drawn. In rohu (*Labeo rohita*), early maturity through management and subsequent breeding was achieved that will help in improving pond fish productivity. Riverine catfish (*Pangasius pangasius*) could breed in captivity, indicating possibility of its artificial propagation and mass-scale seed production.

Crop management

Annada, Naveen and IR 64 rice varieties and Rajlaxmi and KRH 2 hybrids have been found suitable for direct-seeded aerobic condition in coastal Orissa. The increase in soil organic carbon was about 0.1% after two years with full residue incorporation of rice or of both rice and wheat. In sugarcane ratoon crop, paired-row planting system significantly reduced gaps, produced highest number of millable canes and cane yield over conventional planting in subtropical region of the country. Four plant health clinics have been established for knowledge support and demonstration of IPM strategies. Pest Management Information System (PMIS) has been developed on cotton, brinjal and okra, and a decision-making software (Pesticide Advisor) with information on available pesticides has also been developed. Bumble bees has been found good pollinator of crops in temperate conditions, and the research on their artificial rearing is in progress.

GPS and GIS based information on bird-roosting sites vis-à-vis proximity to preferred food and feeding activity of birds to demonstrate correlation with cropping patterns and preparation of wooden nest boxes that are readily acceptable for breeding common myna and spotted owlet are some of the salient achievements. A meadow-orchard system has been developed for guava accommodating 5,000 plant/ha for high yield. Rice-potato-okra or rice-potato-jute or Frenchbean are found most remunerative cropping sequence for potato. Tomato, peas, majadi okra, muskmelon and bean varieties have been standardized for polyhouse cultivation. Raised-bed planting of onion with drip-irrigation has been developed. Neem oil along with *Trichoderma harzianum* and

Pseudomonas fluorescens proved effective in managing anthracnose and greenaria leaf spot in grape. Walnut selections propagated vegetatively were found promising for earliness and nut quality. A package has been developed for management of oily leaf spot diseases/bacteria leaf spot disease of pomegranate.

More than 61,000 tonnes quality seed were produced including 5,291 tonnes of breeder seed of centrally released varieties and 2,520 tonnes of state released varieties of cereals, forage crops, oilseeds, pulses and fibre crops. In addition, 52,000 tonnes of seeds of horticultural crops including medicinal and aromatic plants were produced. About 22.5 million saplings of horticultural crops and 2,800 packets of mushroom spawn were produced.

Livestock management

District-wise database on feed and animal resources has been developed for six agro-ecosystems of the country to plan for bridging gap between demand and supply of feed and fodder. Cost-effective, locally available, feed resources were utilized for formulation of complete feed-block for yak. A lowcost animal feed mixer for mixing heterogenous feed ingredients has been designed and developed. In buffaloes, supplementation of bypass protein rich in limiting amino acids (lysine and methionine) improved their milk production. Digestibility of nutrients and performance of poultry birds improved after supplementation of deoiled rice-bran-based diets with xylanase. Transcervical artificial insemination technique using frozen-thawed semen was standardized in sheep for effective artificial insemination. As the semen collection is very difficult in mithuns, its effective method was standardized. Cumulative toxicity due to high concentration of cadmium has been found to cause infertility in buffaloes. An indigenous medicine, M-cure, was developed and evaluated for treatment of skin disease (sarcopticosis) in camel. A safe inactivated pentavalent vaccine has been developed against bluetongue in sheep, and it has passed safety test.

Post-harvest management and value-addition

In a significant development, nanotechnology using nanoparticles of zinc oxide and silver oxide for coating has been successfully used to impart antimicrobial treatment to paper and fabric. This will lead to retaining quality of printed paper for a longer period and also in the manufacturing of medical and health-care textiles. New avenues for development of smart textiles have been opened. Jute-synthetic fibre blends have been successfully prepared for such diverse applications as apparel and geo-textiles. Water- and termite-resistant jute-fibreglass reinforced shellac sheets for partition walls and panels have been developed.

Community-level evaporatively cooled storage (ECS) structures could be an important link in cool chain development for horticultural produce. The ECS structure has been shown to enhance shelf-life of potato, kinnow and tomato significantly. A low-cost technology for preparing extruded products from sorghum and legumes has been developed. Several value-added products from horticultural, livestock and fishery

produce have been developed. These include jelly, leather, powder and toffee from aonla, Srikand from jackfruit, coated trout fillets, curried products from freshwater fish, canned trout, prawn soup powder, smoked fish, tuna biryani and ready-to-serve mahaseer curry. Technologies for long shelf-life of paneer, gulab-jamun mix and palada paysam mix have been transferred to industry. A simple test has been developed for detection of adulteration of ghee with vegetable oils and fats.

Agricultural engineering and energy management

In this, notable developments are zero-till drill with rotary slit opener, 7- row seed-cum-fertilizer attachment for rotavator, multipurpose implement for sugarcane, turmeric harvester, banana shredder and banana clump remover as tractor-operated machineries. A self-propelled fodder harvester has been developed. Other implements and machineries developed are: barrow-type seed-cum-fertilizer spreader, single/two-row inclined plate planter for cotton, power-tiller-operated earthing-cum-fertilizer applicator for sugarcane, bullockdrawn sprayer for soybean, power-operated maize dehusker-cum-sheller, multiplier onion peeler, curry leaf stripper and tree climber. Sugarcane harvesting knife has been ergonomically designed for better performance. A feeding attachment for power-operated chaff cutter has been designed and tested to minimize accidents.

To facilitate partial removal of water from digested slurry from biogas plants, a rotating cylinder-type machine has been developed and demonstrated. Durable improved biomass cook-stoves for agro-industrial and community applications have been fabricated and demonstrated. A solar concentrator has been developed and shown to improve performance of solar photovoltaic power-generation system.

Agriculture Human Resource Development

Niche Areas of Excellence (28) were supported in different agricultural universities for building excellence in specific strategic areas in education and research. More than 180 Experiential Learning Units have been established in 43 Universities for providing skill oriented hands-on training to students. A total of 1,332 students were admitted in U.G. Programmes in 45 Universities and 1,552 candidates in P.G. programmes in 51 Universities through Common Entrance Tests. Junior Research Fellowship was provided to 470 students in agricultural universities. National Talent Scholarship was given to over 1,000 students, who got the admission in UG programmes. Scholarships and fellowships were also provided to meritorious and economically handicapped students.

The NAARM conducted 62 need-based programmes that benefited capacity building of 1,547 participants in different areas. Competence and research capability of 448 faculty-members was improved through Centres of Advanced Studies by organizing 68 trainings. Additional 400 scientists were trained in emerging subject areas through 91 summer / winter schools. Fourteen agricultural universities have been accredited for enhancing quality and relevance of education. A National Core Group, appointed by the ICAR, has initiated revision of post-graduate and doctoral course curricula and syllabi.

Under Indo-US Knowledge Initiative, 13 Borlaug Fellows were selected to get trained in the USA.

Information, Communication Technology and Publicity Services

Information, Communication Technology and Publicity Services have been reorganized under the Directorate of Information and Publications of Agriculture for better delivery and marketing of technologies/products developed by the ICAR. New initiatives were started for transformation of information services by launching scrolling on-line news, digitization of printed literature, single window of ICAR News by combining English, Hindi and ARIS News for various stakeholders.

Information services were brought under single umbrella and process is on to introduce/provide on-line library services in computerized mode. Initiatives have also been put in place to upscale internet connectivity by increasing bandwidth, dedicated lines and reduction in subscription charges. Video conferencing and IP Telephony has been started.

Technology Assessment, Refinement and Transfer

A total of 1,058 technologies in various crops, livestock and fisheries were taken up for on-farm trials with its network of 558 Krishi Vigyan Kendra. The Krishi Vigyan Kendra conducted 18,306 demonstrations on oilseeds spread over 6,284 ha, and 13,042 demonstrations on pulses in 4,286 ha, showing on an average 34.8% and 37.6% more yield than farmers' practices respectively. Besides, 6,206 demonstrations were conducted on cotton, covering 4,281 ha, benefiting 2,495 and 2,450 farmers directly from demonstrations on production technology and farm implements, respectively, in 1,012 and 2,344 ha. KVK also conducted 31,248 demonstrations, covering 10,149 ha on other crops, besides 2,838 demonstrations on dairy, piggery, rabbit-rearing, sheep, goat etc.

A total 39,912 training programmes were organized on various technologies, benefiting 10.94 lakh farmers and farmwomen. Skill-oriented trainings were imparted in different areas of agriculture, benefiting 1.52 lakh rural-youth. Training programmes totalling 3,373 were organized for 80,416 extension personnel to upgrade their knowledge and skills in frontier areas of agriculture technology. Also conducted 5,265 sponsored training programmes for 1.52 lakh participants from government and non-government organizations. Provided 1.1 lakh quintals seed (value Rs 84,852,506) of cereals, oilseeds, pulses, and vegetables; 91.29 lakh saplings/seedlings of fruits, vegetables, spices, medicinal plants, ornamental plants, plantation crops and forest species; 0.89 lakh quintal of bio-products; 40.08 lakh fingerlings and other livestock/ poultry strains to farmers through various KVKs. Also analysed 1.11 lakh samples of soil, water, plants and manures.

National Agricultural Innovation Project (NAIP)

The Council had launched NAIP in 2006 with an overall objective to facilitate accelerated and sustainable transformation of Indian agriculture in support of poverty alleviation and income generation through collaborative development and application of agricultural innovations by the public organizations in partnership with farmers groups, private sector and other stakeholders. The research funding is made on competitive basis. In the competitive grant scheme, 992 Concept Notes were submitted for funding under the NAIP components on production to consumption system research; sustainable livelihood security and basic and strategic researches in agriculture. A total of 37 have been recommended for full proposal development and have been approved. Second call for competitive projects under the NAIP is made and review of the Concept Notes by expert committees has been completed.

Projects 21 in number have been approved under the National Fund for Basic Strategic Research (NFBSR) of the ICAR and 14 are in implementation. These projects are multi-institutional, multidisciplinary, diverse, novel and in advanced areas of molecular and genetic bases of crop-plants, responses to biotic and abiotic stresses, physiology, rumen microbial manipulation to enhance feed efficiency in cattle, hybrid development in plant, etc. These projects are expected to generate new knowledge, solve outstanding scientific problems and also will be directly applicable in near future for technology development to solve problems in agriculture

Organization and management

Perspective Plan Vision 2025 documents of 94 ICAR Institutes have been brought out. Fifteen Research Institutes/Centres of the ICAR have been notified in the Gazette of the Government of India, raising total number of notified Institutions to 104 under rule 10 (4) of the Official Language Rule 1976. The Budget Estimate (BE) and Revised Estimate (RE) of the DARE and ICAR (Plan, Non-Plan) for 2006-07 were Rs 2,160 crore and Rs 2,276 crore, respectively, and BE for 2007-08 (Plan and Non-Plan) is Rs 2,460 crore. In recognition and to encourage professional excellence, the ICAR gave 54 awards under 12 different categories to honour institutions, scientists and their associates, farmers and journalist. Besides, Rajbhasha Award was also given.

Partnership and linkages

A MoU was signed between the ICAR and Cornell University, USA. Workplans were also signed with University of Western Australia, Australia and the Ministry of Agriculture and Food Industry, Socialist Republic of Vietnam. Two projects, Atmospheric Brown Cloud and Multi-trophic Interactions in the Rhizosphere and Management of Nematode pests and Diseases have been approved for implementation. An India - US Joint Workshop on 'Curriculum Development', under the Agriculture Knowledge Initiative (AKI), was organized at New Delhi.

Looking ahead

The ongoing XIth Plan aims at an overall growth rate of national economy at 10% with a growth rate of 4.1% per year in agriculture during the Plan period. To achieve XIth Plan targets of growth rate with an inclusive agricultural growth, enhancement of resource-use efficiency, farm productivity and profitability would be central to overall strategy. Keeping this in view, our priority areas would be Eco-region specific technology generation and extension in continuation; Systems perspective in research and education; Enhancement of water productivity and nutrient-use efficiency; Climate change and management of stresses; Land use systems for multi-functional agriculture; Diagnostics, vaccines and delivery systems; Value-added product development, food safety and quality assurance; Biosensors, bio-fuels, bio-molecules, bio-fortification biosafety, bio-security, bio-remediation and bio-fertilization; IT-based decision support systems for technology transfer; Human resource development in niche areas; excellence in education and skill development in identified potential areas and Enabling mechanisms for enhancing R&D productivity. This calls for significant new initiatives in research and development and enhanced investments for technology generation relevant to different regions/situations. In the national efforts to accelerate much needed growth in farming sector, as in the past, the Council would continue to remain a committed partner. In this endeavour we would solicit your valuable suggestions and guidance to move ahead.

Source: <http://www.dare.gov.in/highlightS/h23.htm>