



डा. एस. अय्यप्पन

सचिव एवं महानिदेशक

**Dr. S. AYYAPPAN**

SECRETARY & DIRECTOR GENERAL

भारत सरकार  
कृषि अनुसंधान और शिक्षा विभाग एवं  
भारतीय कृषि अनुसंधान परिषद  
कृषि मंत्रालय, कृषि भवन, नई दिल्ली 110 114

GOVERNMENT OF INDIA  
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION  
AND

INDIAN COUNCIL OF AGRICULTURAL RESEARCH  
MINISTRY OF AGRICULTURE, KRISHI BHAVAN, NEW DELHI 110 114

Tel.: 23382629; 23386711 Fax: 91-11-23384773

E-mail: dg.icar@nic.in

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1997

**Dear Colleague,**

Greetings for a happy, prosperous and productive New Year - 2012.

Nearing 2012 is once again time for greetings, compliments and plans, for it would herald the beginning of the XII Five Year Plan. Indian agriculture was celebrated during 2011 for the highest ever food production in all components of cereals, pulses, fruits and vegetables, meat, milk, fish and eggs, with the growth rate of 5.4%.

ICAR led the decoding of the pigeon pea genome, a first time accomplishment by an entirely Indian group of Scientists. Nanomaterials were sourced for phosphatic fertilization with measurable success. The trend of varietal releases to suit various agro-ecosystems and breeder seed production across various field and horticultural crops was continued, with greater emphasis on emerging challenges of abiotic stresses. The National Initiative on Climate Resilient Agriculture spread its wings, with crop varieties for climate change as well as relevant ground level interventions in villages, enabling science-led agriculture. Enhanced productivity levels of pulses made news through over 6,000 demonstrations across the country, leading to a record all-time high in pulse production. DIVA kit for differentiating between naturally infected cattle and buffaloes with Foot and Mouth Disease (FMD) and vaccinated animals; a new strain of pig for the North Eastern Region; breeding of marine fish, *Pompano*; value chains for Banana pseudostem and Oceanic tuna; and special packaging for flowers, under NAIP, were among the many notable contributions of ICAR.

A long felt need of the Council to have a corporate platform was met with the approval of the Union Cabinet for 'AgriInnovateIndia', for relevant activities both at home and abroad. International cooperation took a new dimension with the launching of the Borlaug Institute for South Asia (BISA) with CIMMYT during the year. A Knowledge-Innovation Repository in Agriculture for North-East (KIRAN) and Rice Management Portal were launched, while the National Agro-Biodiversity Management Board was reconstituted. The ICT efforts in agricultural research and education got a boost with more e-Courses in agriculture taking shape, along with the National Bioinformatics Grid and mobile extension services for a comprehensive approach from 'seed-to-market'. ICAR also went overseas with participation in trade fair at Muscat and provided open access to all its publications, towards globalization of the programmes. We are increasingly getting engaged with international agencies, CGIAR Institutions and Universities, with appreciable efforts in capacity building in Africa, in terms of both receiving students through Fellowships as well as visits of our Colleagues to different countries.

Responding to the changing needs, we are revisiting our formats from 'Recruitments to Rewards' in terms of ARS guidelines, capacity building for scientists, KVK guidelines, nomenclatures of Institutes and Divisions, AICRPs and AINPs, Research Advisory Committees, Research project files, Performance indicators and ICAR awards. It is also heartening that the Principal Secretary to the Hon'ble Prime Minister constituted an Inter-Departmental Committee for formulation of a comprehensive policy for research and education in agriculture, with DARE/ICAR as the Nodal Point. This provides us an opportunity for chartering a long term path for individual as well as institutional excellence in the cause of the Indian farming community. I would like to compliment you for bringing out the Vision-2030 documents, that would also feed into the policy perspective being formulated.

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It was a memorable occasion for the NARS when the Hon'ble Prime Minister of India addressed the 83<sup>rd</sup> Foundation Day of ICAR on the 16<sup>th</sup> July, 2011, and I quote:

*"The ICAR has served our country with great distinction for over eight decades now. It has done pioneering work in many areas of agricultural research, leading to very significant breakthroughs in several areas. The contribution of ICAR scientists in the achievement of national self-sufficiency in foodgrains and diversity in food production is truly enormous" and further, "You have a record to be proud of and although the future challenges are truly enormous, I am sure our agricultural research system will succeed in delivering the national good, whatever be the odds. With these words, I wish the ICAR family, all success in its efforts. May God bless your path."*

The above words would be the guiding principles for our endeavors in the coming Plan. We have had an extensive consultation process involving all stakeholders through the year, with Progressive and Innovative farmers, Networks of subject matter specialists, Vice Chancellors and Deans of State Agricultural Universities, Directors and Heads of Divisions of ICAR Institutes, Professional agricultural societies and NGOs, as well as special consultations for Agricultural knowledge management, Gender perspective in agriculture and Inter-Departmental discussions. We are beholden to the Hon'ble Union Minister of Agriculture and Food Processing Industries and President of the ICAR Society, who has been guiding our efforts all the time, for also convening special meetings of Scientists from different disciplines and Institutes for a one-to-one interaction, for the first time, that has sent waves across the scientific community in the system.

As we move further, we are embarking on two missions, 'Farmer FIRST', and 'Student READY', as also Consortia platforms for achieving greater partnerships. Two major projects, viz., National Agricultural Education Project and National Agricultural Entrepreneurship Project are being formulated. In our efforts to do things differently, mechanisms are being developed for Extramural funding, Post Doctoral Fellowships, Agri-Innovation fund, Agri-Incubation fund, Regional processing & fabrication hubs and Referral & Certification facilities. Upgradation of some of the Institutes as Deemed Universities is also on the anvil.


Indian agriculture, agricultural research, education and all associated aspects are in focus and there is a great deal of enthusiasm as well as expectation among our stakeholders. Instead of saying how much we have done, we shall see how much remains to be done. We are at an important stage of agricultural transformation, from 'primary agriculture to secondary agriculture' and look at XII Plan as an opportunity for making a change in enabling and ennobling agricultural research. At Family NARS and Team ICAR, prioritizing the programmes, recognizing our strengths, joining hands for greater synergy and, a winning strategy are the need of the hour, to make agriculture more rewarding and remunerative.

I am sure you will continue to give your best as in the past and I wish you all the best.

**With regards,**

Encl: ICAR Salient Achievements – 2011

**Yours sincerely,**



**( S. Ayyappan )**

Distribution:

1. AS(DARE) & Secy., ICAR; AS & FA, DARE/ICAR
2. DDGs; ND, NAIP; ADGs; NCs; Principal Scientists; Senior Scientists; Directors; Deputy Secretaries; Under Secretaries of DARE/ICAR Hqrs.
3. Directors of ICAR Institutes/Directorates/Bureaux/NRCs; Project Coordinators; Zonal Project Directors; Programme Coordinators

For kind information:

1. President, NAAS
2. Chairman, ASRB; Members, ASRB; Secretary, Controller of Examinations, Deputy Secretary, Controller (Online Examinations), Under Secretary, ASRB
3. Vice-Chancellors of State Agricultural Universities/Central Agricultural University



**INDIAN COUNCIL OF AGRICULTURAL RESEARCH  
SALIENT ACHIEVEMENTS- 2011**

**NATURAL RESOURCE MANAGEMENT**

- GIS-based soil fertility maps (for both major and micronutrients) for 62 major districts of the country prepared using 30,000 geo-referenced soil samples.
- Identified Biochar production from crop residues as a potential option to sequester carbon, increase crop productivity, profitability and sustainability of soil systems in rainfed production systems.
- Identified Rice-potato+Wheat-greengram intensive cropping for irrigated medium land of Jharkhand, which enhanced production four times, employment by 174% and cropping intensity by 300%.
- Lac cultivation – A Success in Betul District with additional average income of Rs. 7,320 per farmer.
- Recorded new genera of mushrooms, viz., *Humidicutis*, *Leucoagaricus*, *Leucopaxillus*, *Micromphalea*, *Otidea*, *Schizostoma*, *Tulostoma* and *Vascellum*.

**PRODUCTIVITY ENHANCEMENT**

- Released Forty eight varieties/hybrids of major food crops of rice, wheat, maize and pulses for different agro-climatic regions of the country. For the first time, a long-duration rice hybrid CR Dhan 701 developed for irrigated-and-shallow lowlands.
- Of the 16 maize hybrids/composites released for different agroclimates, eight are public sector hybrids, viz., DMH 119, PMH 4, PMH 5, Vivek 39, Vivek 43, KMH 22168, HQPM 4 and HSC 1, and one is a public sector composite variety Shatak 9905 for drylands in Maharashtra.
- Released eight maize hybrids/varieties, viz., Maize Hybrid 39, Vivek Maize Hybrid 43, VL Matar 47, VL Masoor 514, VL Masoor 133, Vivek Matar 11, VL Tamatar 4 and VL Shimla Mirch 2, for hilly regions.
- Released four high-yielding pulses, viz., Ujjawal of *Kabuli* chickpea for the central zone; IPM 02-3 of mungbean for spring in the north-western plains zone; IPM 02-14 for summer in the south zone; and IPF 4-9 of field pea for Uttar Pradesh.
- Three groundnut varieties viz., Girnar 3, Kadiri Harit and GPBD 5 notified for Andhra Pradesh and GJG-HPS 1 for Gujarat.
- Released Cotton CSHG 1862, a GMS-based *hirsutum* hybrid, for the irrigated north zone; and nine cotton cultivars notified for commercial cultivation in the country.
- Validated a PCR-based protocol to detect latent infection of *Phytophthora infestans* in seed potato tubers.
- Developed four new varieties, viz., Punjab Flame, Punjab Elegance, Punjab Lemon Delight and Punjab Glance of *Gladiolus* and two varieties, Kaul and Khoshoo of *Chrysanthemum*.
- Developed a new strain of pig for the N-E region.
- Produced triplet lambs through selective breeding in Muzaffarnagari sheep and improved twinning rate to around 14%, for the first time.
- Produced twin *in-vitro* fertilized male and female goat kids.
- Provided household nutritional security and supplementary income through CARI Model of Backyard Poultry Farming in Keonjhar, Mayurbhanj and Sambalpur districts of Odisha.
- Bred the *Silver pompano*, one of the high-value marine tropical finfishes and larval production accomplished.
- Developed a probiotic- based shrimp seed production technique.

**CUTTING EDGE SCIENCE**

- Decoded genome of pigeonpea, one of the most important pulse crops of India, being the first such endeavour by an entirely Indian group of scientists. A total of 47,004 protein-coding genes were identified in the pigeonpea genome, of which 1,213 are for disease resistance and 152 are for tolerance to drought, heat and salinity.



- Accomplished transformation of sunflower for conferring resistance to sunflower necrosis disease through deployment of *TSV-CP* and *CP-AS* gene(s) via *Agrobacterium*-mediated transformation of cotyledons.
- Whole genome sequencing of one female *Murrah* buffalo (NDRI 5620) was undertaken, and the buffalo assembly integrated into a publicly available genome browser (<http://210.212.93.84/cgi-bin/gb2/gbrowse/bovine/>).
- Prepared positive marker vaccine for FMD virus by incorporating GFP epitope and tested in 12 crossbred female calves. A novel FMD virus Asia 1 (Indian Vaccine strain) replicon based viral vector developed for vaccine research and development.
- Initiated two projects, viz., 'Phenomics of moisture deficit and low temperature stress tolerance in rice' and 'Development of pod borer resistant transgenic pigeonpea and chickpea'.

## AGRICULTURAL MECHANIZATION AND ENERGY MANAGEMENT

- Developed twin-row power weeder with float and rotary cutting blade, for SRI cultivation being now manufactured under the brand name, *Garuda*.
- Developed *in situ* Jute retting technique to extract quality jute fibre using low volumes of water.
- Developed a power-operated unit of *Aloe vera* gel extractor to improve the gel extraction.
- Developed a novel power-driven sliver making machine, CIRCOT Minicard.
- Fabricated a solar-assisted heat pump dryer (20 kg/batch capacity).

## POST-HARVEST MANAGEMENT AND VALUE ADDITION

- Incorporated nanocellulose from cotton waste in starch based films for packaging food items.
- Designed biomethanation plant for digestion of fruit and vegetable processing residues for energy generation, ~50 m<sup>3</sup> of biogas daily and installed at Vegetable Unit of Mother Dairy Foods Processing Ltd, Mangolpuri, New Delhi.
- Digital radiography, CT and MRI imaging techniques could detect the presence of seed weevil in mango samples, which is extremely difficult to judge by means of simple visual observation.
- Developed Value chains for Banana pseudostem and Oceanic tuna.
- Developed Eco-holi and textile colours from vegetable sources and process for production of safe, low-cost *holi* powder from cassava (tapioca) flour.

## CAPACITY BUILDING

- Added 19 new Experimental Learning Units to the existing 264 units in 51 universities, to provide experience-based and skill-oriented hands-on-training to the students and revised the guidelines for ELUs.
- Initiated NAIP Consortium on Strengthening Statistical Computing for NARS ([www.iasri.res.in/sscnars](http://www.iasri.res.in/sscnars)) for providing research guidance in statistical computing and computational statistics.
- The National Agricultural Bioinformatics Grid (NABG) in the ICAR will be a national facility to provide computational framework to support biotechnological research in the country.
- Created a centralized Statistical and Computational Genomics Lab (SCGL) Facility.
- Designed an e-Learning solution, "e Learn Agriculture" at the IASRI, New Delhi.
- Developed *AgriDaksh*, a Knowledge Management tool for online expert system for crops.

## TECHNOLOGY ASSESSMENT, REFINEMENT and TRANSFER

- The number of KVKs in the country is now 605.
- Assessed 2,659 technologies by conducting 26,590 trials on farmers' fields in 4,286 locations on various crops and animals.



- Refined 208 technological interventions in case of crops and animals under different thematic areas in 283 locations.
- Conducted 94,951 frontline demonstrations on cereals, millets, oilseeds, pulses, cotton and other important crops covering an area of 21,663 ha.
- Organized 55,989 training programmes with the participation of over 15.96 lakh farmers, farm women, rural youths and in-service extension personnel.

#### **IP PORTFOLIO MANAGEMENT**

- Received one international and three national patents and 198 extant varieties were registered and granted protection.
- 'Weather Cock' software package, registered by the Central Research Institute for Dryland Agriculture, Hyderabad for climate change and agro-meteorological analysis.

#### **PARTNERSHIP AND LINKAGES**

- ICAR-CIMMYT initiative for Borlaug Institute for South Asia (BISA).
- India Chairing the Asia-Pacific Association of Agricultural Research Institutions (APAARI) for 2011-12.
- Signed MoU with DRDO for conservation of Plant Genetic Resources in the National Permafrost Repository at Chang-La, Leh, Ladakh (J&K).
- CSICAR, a joint ICAR – CSIR portal operationalised on August 15, 2011.

#### **INFORMATION, COMMUNICATION and PUBLICITY SERVICES**

- Directorate of Information and Publicity in Agriculture (DIPA) redesignated as Directorate of Knowledge Management in Agriculture (DKMA) with Agricultural Knowledge Management Centres (erstwhile ARIS Cells) across the Council.
- Open access policy for research journals -*The Indian Journal of Agricultural Sciences* and *The Indian Journal of Animal Sciences*.
- Launched *Agribiotech Digest*, a quarterly newsletter, in 13 languages; monthly newsletter *ICAR Mail* in English and *ICAR Chitthi* in Hindi; AGROWEB-Digital Dissemination Systems.
- ICAR *Geet* composed.

#### **O&M REFORMS**

- Revised Guidelines for ARS and KVK being formulated.
- Modified FOCARS and capacity building programmes for Scientists.
- Nomenclature of Divisions and Institutes being revisited.
- Performance indicators for Institutes being finalized.
- Revised format of Regional Committees with KVK interactions.