

# ICAR

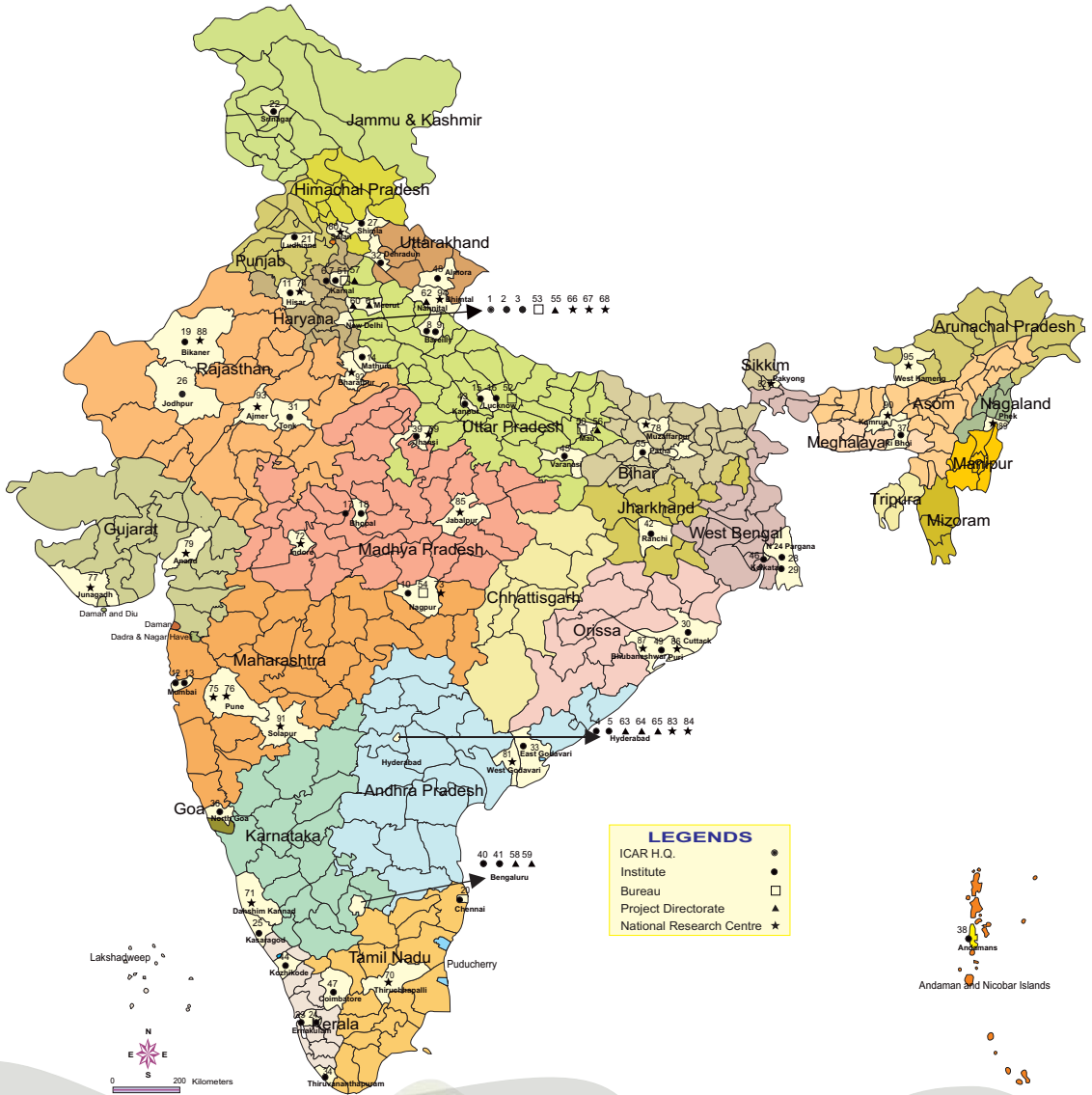
at a glance



**Indian Council of Agricultural Research**  
New Delhi, July 2008

# Indian Council of

(Institutes, Bureaux, Project Directorates)



● 48 ICAR Institutes ● 5 Bureaux ● 11 Project Directorates ● 30 National Research Centres  
 ● 138 Substations of ICAR Institutes ● 77 AICRPs/AINPs ● 561 Krishi Vigyan Kendras (KVK)  
 ● 41 State Agricultural Universities (SAUs) ● One Central Agricultural University and  
 4 Central Universities having faculty of agriculture

# Agricultural Research

## and National Research Centres)

Entity ID	Headquarters
1	Indian Council of Agricultural Research, New Delhi
<b>ICAR Institute</b>	
2	Indian Agricultural Research Institute, New Delhi
3	Indian Agricultural Statistics Research Institute, New Delhi
4	National Academy of Agricultural Research Management, Hyderabad, Andhra Pradesh
5	Central Research Institute for Dryland Agriculture, Hyderabad, Andhra Pradesh
6	Central Soil Salinity Research Institute, Karnal, Haryana
7	National Dairy Research Institute, Karnal, Haryana
8	Central Avian Research Institute, Bareilly, Uttar Pradesh
9	Indian Veterinary Research Institute, Bareilly, Uttar Pradesh
10	Central Institute for Cotton Research, Nagpur,
11	Central Institute for Research on Buffaloes, Hisar, Haryana
12	Central Institute for Research on Cotton Technology, Mumbai, Maharashtra
13	Central Institute of Fisheries Education, Mumbai
14	Central Institute for Research on Goats, Mathura, U.P.
15	Indian Institute of Sugarcane Research, Lucknow, U.P.
16	Central Institute for Subtropical Horticulture, Lucknow, U.P.
17	Central Institute of Agricultural Engineering, Bhopal, M.P.
18	Indian Institute of Soil Science, Bhopal, Madhya Pradesh
19	Central Institute of Arid Horticulture, Bikaner, Rajasthan
20	Central Institute of Brackishwater Aquaculture, Chennai
21	Central Institute of Post Harvest Engineering & Technology, Ludhiana, Punjab
22	Central Institute of Temperate Horticulture, Srinagar, J&K
23	Central Marine Fisheries Research Institute, Cochin
24	Central Institute of Fisheries Technology, Cochin
25	Central Plantation Crops Research Institute, Kasaragod
26	Central Arid Zone Research Institute, Jodhpur, Rajasthan
27	Central Potato Research Institute, Shimla, H.P.
28	Central Research Institute for Jute and Allied Fibres, Barrackpore, West Bengal
29	Central Inland Fisheries Research Institute, Barrackpore
30	Central Rice Research Institute, Cuttack, Orissa
31	Central Sheep and Wool Research Institute, Avikanagar
32	Central Soil and Water Conservation Research and Training Institute, Dehradun, Uttarakhand
33	Central Tobacco Research Institute, Rajamundry
34	Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala
35	ICAR Research Complex for Eastern Region, Patna, Bihar
36	ICAR Research Complex for Goa, Goa
37	ICAR Research Complex for NEH Region, Ri Bhoi,
38	Central Agricultural Research Institute, Port Blair
39	Indian Grassland & Fodder Research Institute, Jhansi, U.P.
40	Indian Institute of Horticultural Research, Bengaluru
41	National Institute of Animal Nutrition and Physiology, Bengaluru, Karnataka
42	Indian Institute of Natural Resins and Gums, Ranchi
43	Indian Institute of Pulses Research, Kanpur, U.P.
44	Indian Institute of Spices Research, Marikunnu, Kerala
45	Indian Institute of Vegetable Research, Varanasi, U.P.
46	National Institute of Research on Jute and Allied Fibre Technology, Kolkata, West Bengal
47	Sugarcane Breeding Institute, Coimbatore, Tamil Nadu

Entity ID	ICAR Institute
48	Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora, Uttarakhand
49	Central Institute of Freshwater Aquaculture, Bhubaneswar, Orissa

<b>Bureau</b>	
50	Agriculturally Important Micro Organisms, Mau Nath Bhanjan, Uttar Pradesh
51	Animal Genetic Resources, Karnal, Haryana
52	Fish Genetic Resources, Lucknow, Uttar Pradesh
53	Plant Genetic Resources, New Delhi
54	Soil Survey & Land Use Planning, Nagpur, Maharashtra

<b>Project Directorate</b>	
55	Maize, New Delhi
56	Seed, Mau Nath Bhanjan, Uttar Pradesh
57	Wheat, Karnal, Haryana
58	Biological Control, Bengaluru, Karnataka
59	Animal Disease Monitoring and Surveillance, Bengaluru
60	Cropping Systems, Meerut, Uttar Pradesh
61	Cattle, Meerut, Uttar Pradesh
62	Foot and Mouth Disease, Mukteshwar, Uttarakhand
63	Poultry, Hyderabad, Andhra Pradesh
64	Oilseeds, Hyderabad, Andhra Pradesh
65	Rice, Hyderabad, Andhra Pradesh

<b>National Research Centre</b>	
66	Agricultural Economics and Policy, New Delhi
67	Integrated Pest Management, New Delhi
68	Plant Biotechnology, New Delhi
69	Agroforestry, Jhansi, Uttar Pradesh
70	Banana, Thiruchirappalli, Tamil Nadu
71	Cashew, Dakshina Kannada, Karnataka
72	Soybean, Indore, Madhya Pradesh
73	Citrus, Nagpur, Maharashtra
74	Equines, Hisar, Haryana
75	Grapes, Pune, Maharashtra
76	Onion and Garlic, Pune, Maharashtra
77	Groundnut, Junagarh, Gujarat
78	Litchi, Muzaffarpur, Bihar
79	Medicinal and Aromatic Plants, Anand, Gujarat
80	Mushroom, Solan, Himachal Pradesh
81	Oilpalm, West Godavari, Andhra Pradesh
82	Orchids, Gangtok, Sikkim
83	Sorghum, Hyderabad, Andhra Pradesh
84	Meat, Hyderabad, Andhra Pradesh
85	Weed Science, Jabalpur, Madhya Pradesh
86	Women in Agriculture, Bhubaneswar, Orissa
87	Water Technology Center for Eastern Region, Bhubaneswar, Orissa
88	Camel, Bikaner, Rajasthan
89	Mithun, Dimapur, Nagaland
90	Pig, Guwahati, Assam
91	Pomegranate, Solapur, Maharashtra
92	Rapeseed-Mustard, Bharatpur, Rajasthan
93	Seed Spices, Ajmer, Rajasthan
94	Cold Water Fisheries, Bhimtal, Uttarakhand
95	Yak, West Kameng, Arunachal Pradesh

The Indian Council of Agricultural Research (ICAR) is an autonomous organisation under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. Formerly known as Imperial Council of Agricultural Research, it was established on 16 July, 1929 as a registered society under the Societies Registration Act, 1860 in pursuance of the report of the Royal Commission on Agriculture. The ICAR has its headquarters at New Delhi.

The Council is the apex body for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With over 90 ICAR institutes and 45 agricultural universities spread across the country this is one of the largest national agricultural systems in the world.

The ICAR has played a pioneering role in ushering Green Revolution and subsequent developments in agriculture in India through its research and technology development that has enabled the country to increase the production of foodgrains by 4 times, horticultural crops by 6 times, fish by 9 times (marine 5 times and inland 17 times), milk 6 times and eggs 27 times since 1950-51, thus making a visible impact on the national food and nutritional security. It has played a major role in promoting excellence in higher education in agriculture. It is engaged in cutting edge areas of science and technology development and its scientists are internationally acknowledged in their fields.

### The Mandate

- To plan, undertake, aid, promote and co-ordinate education, research and its application in agriculture, agroforestry, animal husbandry, fisheries, home science and allied sciences.
- To act as clearing house of research and general information relating to agriculture, animal husbandry, home science and fisheries through its publications and information system, and instituting and promoting transfer of technology programmes.
- To provide, undertake and promote consultancy services in the fields of education, research, training and dissemination of information in agriculture, agroforestry, animal husbandry, fisheries, home science and allied sciences.
- To look into problems relating to broader areas of rural development concerning agriculture, including post-harvest technology, by developing co-operative programmes with other organizations such as the Indian Council of Social Sciences Research, Council of Scientific and Industrial Research, Bhabha Atomic Research Centre, and universities.
- To do other things considered necessary to attain objectives of the Society.

### Organization

- Union Minister of Agriculture is the ex-officio President of the ICAR Society.
- Secretary, Department of Agricultural Research & Education Ministry of Agriculture, Govt. of India & Director-General, ICAR – the Principal Executive Officer of the Council.
- Governing Body is the policy-making authority



- Agricultural Scientists' Recruitment Board
- Deputy Directors-General (8)
- Additional Secretary (DARE) and Secretary (ICAR)
- Additional Secretary and Financial Advisor
- 24 Assistant Directors-General
- National Director, National Agricultural Innovation Project
- Directorate of Information and Publications of Agriculture

### Milestones

- Initiation of the first All-India Co-ordinated Research Project on Maize in 1957
- Status of Deemed University accorded to IARI in 1958
- Establishment of the first State Agricultural University on land grant pattern at Pantnagar in 1960
- Placement of different agricultural research institutes under the purview of ICAR in 1966
- Creation of Department of Agricultural Research and Education (DARE) in the Ministry of Agriculture in 1973
- Opening of first Krishi Vigyan Kendra (KVK) at Puducherry (Pondicherry) in 1974
- Establishment of Agricultural Research Service and Agricultural Scientists' Recruitment Board in 1975
- Launching of Lab-to-Land Programme and the National Agricultural Research Project (NARP) in 1979
- Initiation of Institution-Village Linkage Programme (IVLP) in 1995
- Establishment of National Gene Bank at New Delhi in 1996
- The ICAR was bestowed with the King Baudouin Award in 1989 for its valuable contribution in ushering in the Green Revolution. Again awarded King Baudouin Award in 2004 for research and development efforts made under partnership in Rice Wheat Consortium.
- Launching of National Agricultural Technology Project (NATP) in 1998 and National Agricultural Innovation Project (NAIP) in 2005





## I. Crop Sciences

- The division has played a pivotal role in ushering the era of green and yellow revolutions in the country. The national average productivity raised by 2-4 folds in foodgrains, rapeseed-mustard and cotton since 1950-51.
- Spectacular success has been achieved in introduction and improvement of new crops, such as soybean and sunflower; India is now the fifth largest producer of soybean in the world.
- The division has supported the development of improved crop cultivars and appropriate crop production–protection technologies, along with promoting the basic/ strategic/ applied research in cereals, millets, pulses, oilseeds, commercial crops and fodder crops.
- Developed and released over 3,300 high-yielding varieties/hybrids of field crops for different agro-ecologies.
- Facilitated development, evaluation and identification of technologies through the All-India Co-ordinated Projects.
- First in the world to develop hybrids in grain pearl millet, castor, pigeonpea and cotton in the 1970s; developed hybrids in other crops, like rice, safflower and rapeseed-mustard.
- Developed single cross hybrids of QPM (quality protein maize) having high nutritional value and yield, and high yielding baby corn.
- Developed and introduced early and suitable plant types in rice, sorghum, cotton, pigeonpea, chickpea, greengram, blackgram etc.; these have opened up avenues for multiple cropping systems and helped in enhancing cropping intensity; early pulse varieties have helped in claiming the new niche areas such as early chickpea varieties in Andhra Pradesh that led to high productivity in the crop.
- Some of the improved Indian varieties have acclaimed global spread in case of sugarcane, wheat, rice, pigeonpea, sorghum and mustard.
- For the first time, successfully employed molecular marker assisted selection/pyramiding of xa 13 and Xa 21 genes from the source variety IRBB 55 in the genetic background of Pusa Basmati 1; thus developed bacterial blast resistant variety, Improved Pusa Basmati 1.
- Developed Bt-cotton in an indigenous variety Bikaneri Narma, for resistance to bollworms.
- First ever map-based cloning and characterization of the gene Pi-kh was achieved in the country. This gene confers resistance to blast disease in rice. The gene integration was validated in transgenic rice.
- Identification of novel *Arabidopsis*- derived promoter, that drives constitutive expression of foreign genes in transgenic plants.
- Isolated and cloned drought stress-responsive transcription factors (TaCBF5 and TaCBF9) from drought tolerant wheat variety C 306.



# Salient Achievements



- Sequenced 6.7 million base pairs of long-arm of chromosome 11 of rice under the international rice genome initiative.
- DNA fingerprinting of 2,272 released varieties and landraces of 33 major crops carried out.
- Conserved over 0.36 million germplasm accessions of crops and their wild relatives at National Gene Bank, NBPGR, New Delhi, and 2,517 microbial cultures at NBAIM, Mau.
- Created digitalized database of over 175,000 insect species and fauna of British India volumes at IARI, New Delhi.
- Established a mechanism of registration and documentation of valuable plant germplasm at NBPGR, New Delhi and registered over 600 genetic stocks of different plant species.
- Developed the bio-insecticide strain DOR Bt.1; registered, patented and commercialized its formulation KNOCK W.P along with a low-cost mass multiplication methodology for integrated management of semilooper caterpillar in a number of crops.
- Developed endosulfan-tolerant strain of *Trichogramma chilonis* (Endograma).
- Developed DUS (Distinctiveness, Uniformity and Stability) testing parameters for 35 crops for Indian plant variety protection system; Indian Information System (INDUS) software developed for varietal documentation; Digitalized and protected prominent extant-notified varieties.
- Seed production technologies refined for various crops; hybrid seed production technology developed in non-traditional crops such as rice, pigeonpea and safflower.
- Breeder seed production was greatly enhanced (about 2 times in field crops, 5 times in horticultural crops and 2.5 times in fisheries) during the period 2005-2008; thus improving the availability of much needed quality seed and planting material in the country.
- Basic/ strategic/anticipatory/applied research being promoted through network projects on transgenics, gene pyramiding, marker assisted breeding, application of microorganisms in agriculture and allied sectors insect systematics, wilts, mycotoxins, QPM etc., and mega seed project on seed production.
- Developed and implemented the Guidelines for Intellectual Property Management and Technology Transfer/ Commercialisation of Technologies in 2006.



## 2. Horticulture

- Developed 721 high yielding varieties and production technologies in horticultural crops leading to the 'Golden revolution'. Through adoption of these technologies, India has emerged as the second largest producer of fruits and vegetables in the world. It has substantially improved the food and nutritional security.
- Through the adoption of improved technologies, production increased up to 2.4 fold in banana and tomato, 1.6 fold in potato and 1.3 fold in cassava from 1991-92 to 2005-06.
- Released export quality red-peeled and regular bearing mango varieties Pusa Arunima and Pusa Surya with long shelf life; developed a regular bearing, anthracnose disease resistant, red colour fruit and high quality mango hybrid H 39.
- Developed early maturing and prolific bearer aonla cultivar Goma Aishwarya, and high input-efficient potato cultivar Kufri Pukhraj.
- Developed technology for seed multiplication in potato through seed plot technique and micro- and mini-tubers.
- Standardized micro-propagation technology for seed and planting material in potato and banana.
- Developed technologies for producing disease free planting material in citrus through shoot tip grafting.
- Standardized high density planting and suitable canopy architecture in apple, pear, pineapple, mango, citrus and guava for improving productivity.
- Developed a micronutrient mixture, Banana Shakthi, for banana crop.
- Developed high productive coconut and arecanut based multispecies cropping systems involving spice crops for enhancing productivity and profitability.
- Standardized technologies for protected cultivation of vegetables, viz. tomato, capsicum, chillies and cucumber for off-season production and crop advancement.
- Developed dwarfing guava root stock Pusa Srijan and also meadow orchard accomodating 5,000 plants per hectare with yield of about 30 tonnes.
- Developed unique grape variety Pusa Navrang with red pigmentation in both peel and pulp for juice making. The variety is resistant to fungal diseases.
- Standardized technologies for post-harvest handling, storage, processing and value addition in horticultural crops.
- Cauliflower waste leaf reduced snail population in elephant foot yam.
- Developed a system of traceability and monitoring of pesticide residues in grapes leading to significant export promotion.





## 3. Natural Resource Management

- For sustainable land use, soil resource, degradation and fertility maps of different agro-ecological regions developed.
- Assessed soil carbon stocks using the benchmark sites under different land use systems of the country.
- Prepared integrated nutrient management packages for major cropping systems.
- Resource Conservation Technologies (RCTs) such as zero tillage, furrow irrigated raised bed planting system and laser land levelling developed.
- Mitigation and adaptation technologies to meet the challenges of climate change were promoted through a network.
- Developed consortia of biofertilizers for major crops.
- Standardized technologies for enriched composts/ vermicompost.
- Developed cost effective amelioration technologies for waterlogged, salt affected and acid soils.
- Developed a network of 47 model watersheds that provided a basis for developing the National Watershed Development Programme for Rainfed Areas (NWDPPRA).
- Evolved rainwater harvesting techniques for enhanced water and crop productivity.
- Cost effective Low Energy Water Application device (LEWA) developed for small farmers.
- Introduced an integrated crop management approach including System of Rice Intensification (SRI) for reducing water and labour inputs and increasing rice grain yield.
- Developed alternative cropping systems for enhanced productivity and profitability for different agro-climatic zones of the country.
- Demonstrated tank-cum-well system for plateau areas with a slope of 2-5% for micro-level water harvesting for increasing cropping intensity (up to 180%) and crop productivity (1.2 to 3.1 tonnes/ha).
- Generated integrated farming system models for enhancing productivity and profitability.
- Developed agroforestry systems for different agro-ecological regions linking paper, pulpwood and herbal medicines based industries.
- Technological backstopping and policy support rendered for promoting balanced use of fertilizers/nutrients.
- Operationalized web-based agro-advisory services.



## 4. Animal Sciences

- A unique National facility, High Security Animal Disease Laboratory with P-4 measures established that played a pivotal role in providing diagnostics services for avian influenza in the country besides developing vaccine using indigenous strains.
- 80% of 140 indigenous breeds of livestock and poultry characterized phenotypically and genetically.
- Five breeds of indigenous livestock and poultry were conserved and characterized both phenotypically and using molecular markers.
- Vrindavani breed of cattle developed with production potential of 3,500 kg milk per lactation.
- Graded Murrah buffaloes with 2,200 kg milk yield per lactation evolved.
- Improved strains of sheep for fine wool (Bharat Merino), carpet wool (Chokla, Marwari, Magra) and meat (Malpura, Nellore, Mandya, Madras Red) developed.
- Artificial insemination method standardized in mithun, yak, camel, goats, pig and equines; first mithun calf born through artificial insemination in India; cryoscope device developed to detect accurate time for insemination in cattle and buffaloes.
- For promoting backyard poultry an early-maturing poultry strain, CARI-Nirbhik, producing 223 eggs by 72 weeks, developed.
- Hormonal-modulation protocols developed to increase egg production in poultry.
- A new fungus genus *Cyllumyces icaris* with better fibre degrading ability identified for the first time in Indian cattle and buffaloes.
- Area-specific mineral supplement for livestock developed.
- Diagnostic kits developed for detecting early pregnancy in equines
- Embryo transfer technology standardized in buffaloes, sheep, cattle, goat and yak.
- Developed indigenous diagnostics and control kits for foot-and-mouth disease (FMD) as import substitution.
- Developed live attenuated vaccine for sheep and goat plague (PPR), a pentavalent vaccine for controlling bluetongue disease in small ruminants.
- Developed bacteriocin-based preparation for effective treatment of bovine mastitis; developed an indigenous medicine, M-cure for treatment of skin disease in camel.
- Established serum bank facility, first of its kind in India, maintaining over 170,000 serum samples for long-term national surveys in infectious bovine rhinotrachitis, brucellosis, rinderpest and bluetongue.



## 5. Agricultural Engineering and Technology

- Developed over 150 agricultural tools, implements and machines for timeliness of farm operations, drudgery reduction and efficient input use for various field and horticultural crops; of which 75 machines commercialized.
- Conducted ergonomic and safety studies leading to reduced drudgery and improved safety of farm machines, particularly, to suit farm women
- Developed renewable energy source-based devices and gadgets such as solar refrigerator, low cost solar cookers and water heaters, solar concentrators for solar photovoltaic (SPV) panels, solar cocoon stiffer, high efficiency cook stoves, pyrolysed briquetted fuels, gasifiers, improved biogas plants, dewatering system for biogas slurry. Utilization of animals in rotary mode for operating different agricultural machines & equipment
- Developed structures, environmental control techniques and packages of production practices for raising nurseries, production of flowers, medicinal plants and off-season vegetables.
- Developed plastic-lining for rain water harvesting ponds and pond based micro-irrigation systems, plastic mulching of crops, carp hatcheries and transportation system for live fish.
- Developed low cost improved storage structures for foodgrains, evaporatively cooled structures for fruits and vegetables, machinery and pilot plants for value addition to agricultural produces.
- Developed equipment for soybean processing and utilization – soybean dehullers, extrusion expelling pilot plant, soyflaking machine, soy snack extruder, cottage level soy-paneer plant, okara fortified soy-cereal snacks.
- Post harvest management and value addition to natural fibres including efficient retting of jute, degumming of ramie, modernization of cotton ginning technology, improved micro spinning system; bioscouring process for fabric, super-absorbent polymer, process for flame retardant finish for fabrics; diversified products from jute, jute geo-textiles, cotton-coir fibres for conveyer belt manufacture, utilization of cotton and jute stalks and byproducts for particle boards.
- Processes developed for microbial production of nano-particles for fabric finishing, extraction of natural dyes, resins and gums from plant based biomass, value added products from coir in combination with other natural fibres.
- Developed equipment for primary processing of lac, processes for preparation of shellac, bleached lac, dewaxed and decolourized lac, insulating varnishes, melfolac, lac wax based emulsions for coating of fruits and vegetables, aleuritic and perfumery compounds.



## 6. Fisheries

- Developed database of 2,200 finfishes and shellfishes in Indian waters.
- Database of marine fishery resources of commercially important fish species developed.
- Identified 31 new species of fishes from western ghats and north eastern region.
- DNA bar coding of 75 species of Indian marine fishes completed.
- PCR-based gender identification of marine mammals developed.
- Microsatellite enriched genomic library developed for *Pangasius pangasius*.
- Milt cryopreservation and breeding protocols developed for the conservation of yellow catfish, *Horabagrus nigricollis*, an endangered fish of western ghats.
- Early maturation and breeding of Indian major carp, rohu (*Labeo rohita*) achieved through photothermal manipulation.
- Cloning and sequencing of genes, viz. gonadotropin GTH I and its releasing hormone (GnRH) encoding cDNAs accomplished in rohu.
- Developed genetically improved rohu, CIFA IR 1, with enhanced growth.
- Achieved mass seed production of freshwater food fishes, viz. medium carps, *Labeo gonius*, *Labeo fimbriatus*, *Puntius sarana*; catfishes, *Ompok pabda*, *Mystus vittatus*; chocolate mahseer, *Puntius hexagonalepis*; and *Chitala chitala*, enabling diversification of culture practices.
- Portable FRP carp hatchery designed and developed.
- Hatchery breeding techniques developed for marine and freshwater ornamental fishes.
- Giant freshwater prawn, *Macrobrachium rosenbergii* bred using inland ground saline water.
- Captive breeding of kuruma shrimp, *Metapenaeus japonicus* carried out.
- Breeding and larval rearing of sand lobster, *Thenus orientalis* achieved, for the first time in the country.
- *In vitro* pearl production in Indian pearl oyster, *Pinctada fucata* and abalone, *Haliotes varia* through tissue culture achieved.
- Breeding and culture of golden mahseer and snow trout carried out.
- Culture systems developed for banana shrimp, *Fenneropenaeus merguensis*.
- Organic inputs, probiotics and bio-remedial measures successfully employed for production of tiger shrimp, *Penaeus monodon*.
- Diagnostic kits developed for white spot syndrome virus in shrimp; white muscle disease in freshwater prawn and aeromoniasis in carps.
- New formulation of shrimp immunostimulant, CIBA-STIM developed.
- Aluminium fishing boat and wooden boats designed and developed for fishing in freshwaters.
- Juvenile fish excluder shrimp sorting device for fishing nets (Smart gear) designed and developed for conservation of marine fisheries.
- Solar drier for fish with LPG back-up developed.
- Protocols for smoked tuna in pouches and marinade from tuna, mackerel and shark developed.



## 7. Agricultural Education

- Financial and professional support provided to Agricultural Universities (AUs) for modernization and strengthening of academic facilities, infrastructure and faculty improvement.
- Accreditation Board established for quality assurance in agricultural education and several AUs accredited.
- Norms, standards, academic regulations and under-graduate course curricula and syllabi revised and made utilitarian as recommended by the IV Deans' Committee and implemented by several AUs.
- Niche areas of excellence established to augment strategic strength of AUs in specific areas including those in new and emerging cutting-edge technologies.
- Over 180 units for experiential learning established in AUs for providing skill-oriented hands-on training to the students at undergraduate level.
- For quality upgradation, reduction of inbreeding and fostering national integration in higher agricultural education, admission of students up to 15% of total seats in undergraduate and 25% seats in post-graduate programmes being centrally undertaken.
- Faculty competence improved through 31 Centres of Advanced Studies.
- About 2,400 scientists trained in emerging areas including cutting-edge technologies through about 90 summer/winter schools organized every year.
- Awarded about 1,000 National Talent Scholarships for undergraduate studies, 475 Junior Research Fellowships for post-graduate studies and about 200 Senior Research Fellowships for Ph.D. annually.
- Promoting excellence at national level through ICAR National Professor and National Fellow schemes.
- Need-based capacity building of NARS through foundation courses, refresher courses, workshops, seminars and international programmes carried out by National Academy of Agricultural Research Management. The Academy also provides policy support, facilitates national dialogues and undertakes consultancies, for performance enhancement of NARS.
- Under the Indo-US Agricultural Knowledge Initiative, about 15 Borlaug fellows selected every year for training in USA; eight joint workshops organised; eight collaborative research projects undertaken, and visits of experts facilitated in the focus areas of (i) Education, learning resources, curriculum development and training; (ii) Food processing and use of byproducts and biofuels; (iii) Biotechnology; and (iv) Water management.
- ICAR facilitates admission of foreign students in Indian AUs by considering the applications received through the DARE, Educational Consultants India Ltd. (Ed. CIL), and Indian Council of Cultural Relations (ICCR). About 200 students are admitted annually in various degree programmes in agriculture, horticulture, forestry, veterinary, agricultural engineering etc.





## 8. Agricultural Extension

- Created a network of over 561 Krishi Vigyan Kendras (KVK), i.e. Farm Science Centres, aiming at assessment, refinement and demonstration of technology/products in the rural districts of the country.
- Assess/validate/refine and demonstrate technologies related to field / horticultural crops, livestock and fisheries under different farming systems, including frontline demonstrations on the farmers' field every year.
- Empowering more than one million farmers and extension personnel annually with need-based knowledge and skill on improved agricultural practices through intensive training programmes.
- Awareness generation among 5 million farmers and other stakeholders annually about improved agricultural technologies through different extension programmes.
- Production and multiplication of location specific improved seeds/saplings/seedlings/fingerlings/livestock and bio-agents in the KVKs as also small farm tools/ implements to make available to farmers.
- Created a comprehensive resource base of Indigenous Technical Knowledge through collection, classification and documentation of over 4000 ITKs and validation of several ITKs including geographical indications (GI) of related plant species.
- Developed methodologies for assessment and refinement of technologies in five agro-ecosystems through TAR-IVLP (Technology Assessment and Refinement through Institution-Village Linkage Programme) under the NATP.
- Gender mainstreaming in agriculture addressed through National Research Centre for Women in Agriculture and AICRP on Home Science.
- Created single window delivery mechanism for technology products, diagnostic services and knowledge sharing through Agricultural Technology Information Centres (ATIC) in ICAR Institutes and State Agricultural Universities.
- Interface meetings involving scientists, development officials and farmers organized at central, state and district level.
- Study visits of farmers to the University main campus of the state concerned facilitated for wide exposure to the latest agricultural technologies.
- Established over 100 demonstration units for rainwater harvesting with micro-irrigation system at district level and over 300 units of soil and water testing facilities for efficient natural resource management.



## 9. National Agricultural Innovation Project (NAIP)

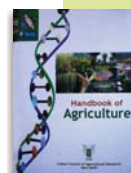
- Earlier the NATP Project was implemented by the ICAR during 1997-2005. The project has contributed to the development of about 300 new technologies and their adoption by farmers besides several new research tools, methodologies and intermediate products.
- The NAIP is being implemented in ICAR since July 2006 with the credit assistance of US\$ 200 million from the World Bank and US\$ 50 million Government of India share. Its main objective is to contribute to accelerated and inclusive growth through collaborative development and application of agricultural innovations by the public research organisations in partnership with private sector, NGOs and other stakeholders. By the end of May 2008, 82 subprojects have been approved at a total outlay of Rs 570 crore covering all the four components.

## 10. Information and Publications

- The agricultural research information system of the Council showcases and markets the developed technologies to various stakeholders.
- Disseminated information through flagship products such as research and popular periodicals, handbooks, monographs, technical and textbooks, popular books etc.
- About 200 publications brought out every year on topical issues related to agriculture.
- Scrolling news — another hallmark — launched at ICAR website.
- More than 80,000 hits per month recorded for [www.icar.org.in](http://www.icar.org.in)
- Accelerating ICT management in agricultural research through inter- and intra-net connectivity to narrow down the gap between technology developers and its users.
- Participated in Technological Exhibitions and Book Fairs of National level/international level to create awareness about agricultural research and education.

## 11. International Co-operation

- Active collaboration with international agricultural research institutions including CG centres, CABI, FAO, NACA, APAARI, UN-CAPSA, APCAEM, ISTA, ISHS etc.
- MoU/Work Plans with over 30 countries for bilateral cooperation in agricultural research, training and study visits.
- ICAR offers quality and cost-effective agricultural education to international students at under-graduate and post-graduate levels. And need-based short-term training programmes in specialized areas are also offered. Special concessions for SAARC students.
- Strong support to CGIAR institutes. Total funding support in 2007-08 of US\$ 2.65 million.



## Road ahead

The Council is continuously reviewing its research activities and developing long-term research strategy to reduce vulnerability of rural poor and accelerate inclusive agricultural growth. Issues prioritized for end to end solution are – growing economic equalities, fragmented and further shrinking agriculture landholdings, drying water resources, hungry soil, changing climate resulting in fluctuations in monsoon and unpredictable weather vagaries (*Vision 2020*). It is working in partnership with other stakeholders integrating knowledge and technologies from all sources, including traditional knowledge of farming community. The IPR policy is being tuned to facilitate international transfer and protection of know how and technologies.

As farming community of nation feels the heat of climate change, sky rocketing food prices, and energy crisis, ICAR knowledge and technologies will help in their effective management. The future plans are to meet the challenges of dynamic agriculture so that opportunities are availed and adverse effects on agricultural growth are countered for positive gains.

For further Information visit [www.icar.org.in](http://www.icar.org.in)

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