APPENDICES

STUDY ON THE RICE SCIENCE COMMUNITIES IN CRRI (INDIA) AND RRDI (SRI LANKA)

[Questionnaire to be filled by the Scientists at CRRI and RRDI who are actively involved in Research & Development work]

Note: [This study aims to understand the research climate and the productivity of scientists in rice research laboratories. The information and data collected through the questionnaire will be treated as confidential and will be used only for academic purposes of this particular study. No individual will be identified in the final analysis.]

Institute's code number: .......... Respondent's code number: .......... 

1. Personal information
(i) Present Designation ..............................................
(ii) Research Division ..............................................
(iii) Age .......... yrs
(iv) Years of R&D experience ......................................
(v) Year of joining the Institute ..................................
(vi) Field of specialization ..........................................

2. Educational qualifications:

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<th>Degree</th>
<th>Year</th>
<th>University</th>
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<td>a) ...............</td>
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<td>b) ...............</td>
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<td>c) ...............</td>
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3. Goal orientations in research

How much importance would you give to the following items? Please answer by circling one number against each item.

[ 5-highly important ; 4-important ; 3-moderate ; 2- little importance ; 1- no importance ]

i) To pursue basic research in my field 5 4 3 2 1
ii) To pursue applied research and extension 5 4 3 2 1
iii) To involve in industrial consultancy 5 4 3 2 1
iv) To write research papers for reputed journals 5 4 3 2 1
v) To do research to develop products for the benefit of industry 5 4 3 2 1
vi) To see products of my research being used by society 5 4 3 2 1
vii) To acquire expertise in science administration 5 4 3 2 1

Contd...
4. Allocation of time for R&D

How much time do you devote for the following work elements? (Indicate as % per week).

a. Teaching ............

b. Research ............

c. Extension ............

d. Administration ............

e. Consultancy ............

f. Other ............

5. Rewards and recognition in the institute

What is your view on the each item given below? Please answer by circling one number against each item.

[5- strongly agree; 4- agree; 3- neither agree nor disagree; 2- disagree; 1- strongly disagree]

i) Happy with the current promotion scheme

ii) Promotions should be based on merit

iii) There are other things than merit which is valued in the lab

iv) Industrial consultancy and bringing project funds are more important

v) Contribution to society should be given top priority

vi) Professional and social relevance should be given equal importance

vii) Publish or perish should be the criteria for rewards/promotions

6. Research climate

What are your views on the following? Please answer by circling one number against each item.

[5- strongly agree; 4- agree; 3- neither agree nor disagree; 2- disagree; 1- strongly disagree]

i) Have freedom to do research on my own ideas

ii) Have to do research mainly on the topics suggested by the institute

iii) Research facilities/equipment in the laboratory are satisfactory

iv) Have a good working relationship with my colleagues

v) Have a good working relationship with my seniors

vi) Institute encourages to participate in the local seminars

vii) Institute encourages to participate in seminars abroad

viii) The atmosphere in the institute is stifling

ix) Social relationships in the institute are based on hierarchy

x) Institute/research groups organizes frequent seminars

Contd...
7. Linkages of structure
i) Do you have collaborative linkages with other ICAR institutes?  Yes ...... No ......
   If yes, please mention the institutes.
a) ..............................................  b) ..............................................
c) ..............................................  d) ..............................................

ii) Does your work have linkages with the Extension System?  Yes ...... No ......
   If yes, specify on the following.
a) National Demonstration Project (ND) ...... d) Krishi Vigyan Kendras (KVK) ......
   b) Trainers’ Training Centres (TTC) ...... e) Other ...........
   c) Institute- village linkage programme (IVLP) ......

iii) Do you have teaching assignments in the Universities and Colleges?  Yes ...... No ......
   If yes, please specify and name the institutes.
a) .....................................................................
   b) .....................................................................

iv) How many Postgraduate students are working with you?  M Phil ...... PhD ......

v) Are you doing consultancy for any industry/ firm/company? ........

8. Collaboration with the research projects at the National Level
Are you involved in any rice research project under the above category?  Yes...... No ......
If yes, please state below.
i) ................................................

9. Research productivity
i) Number of publications in different Grades?
   a) Journals ........
      a) Grade ........
      b) Grade ........
      c) Grade ........
      d) Grade ........
   R* – refereed; NR** – non refereed
   b) Books ........  bulletins ........  News papers ........
   ii) Number of patents/products/ processes?  Local............ Foreign ........
   iii) Number of awards received?  Local ..........Foreign ........
   iv) Any other output? ........

Contd...
10. Participation at meetings/seminars/workshops

(Please indicate your participation during the last three years)

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<th>Local</th>
<th>Foreign</th>
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<tr>
<td>i) Scientific meetings</td>
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<td>ii) Seminars</td>
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<tr>
<td>iii) Workshops</td>
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11. Eminent scientists and best journals in rice research

(a) In your opinion, name three eminent rice scientists

Within the country:
   i) ..............................................
   ii) ..............................................
   iii) ..............................................

At the world level:
   i) ..............................................
   ii) ..............................................
   iii) ..............................................

(b) In your opinion name the two best journals for publication rice research

Within the country:
   i) ..............................................
   ii) ..............................................

At the world level:
   i) ..............................................
   ii) ..............................................

{** I would be grateful if your current CV with complete list of publications is given to me. It will be used in the final analysis but no individual will be identified.**}

******* THANK YOU FOR YOUR KIND COOPERATION *******
Dear ........

Questionnaire Survey on Rice Science Communities

I am a Senior Scientific Officer working at the National Science Foundation (NSF), Sri Lanka. At present I am working on a PhD Programme on S&T Policy, at the Centre for Studies in Science Policy, Jawaharlal Nehru University, New Delhi.

My project title is "National Agricultural Research Systems in India and Sri Lanka: Organization, Scientific Communities and their contribution to Rice Research".

I have been working as the Co-ordinator for agricultural research funding at the NSF for the past 12 years and have been closely associating with the Agricultural Science Community in Sri Lanka. Listening to their problems, difficulties, positive and negative issues in our system in regard to their research productivity, publications and so on made me get interested in this field. As a result I decided to do an in depth study hoping that the out come of the study may help to add value to our scientists and their research work.

Since rice is our staple food and the top priority crop in Sri Lanka, naturally I selected the field of rice research for this study. I will be conducting two case studies for India and Sri Lanka. The data will be collected by literature survey, a questionnaire survey in the Rice Research Institutes in the two countries and direct interviews with the senior scientists and scientific administrators in the NARS of the two countries. I must assure you that this study in no way tries to compare the efficiency or the research productivity of the rice scientists in the two research institutes but will try to find out the best ways that the two systems should adopt.

I have a limited time to spend in Sri Lanka as this is a split PhD programme and I kindly request you to fill this questionnaire completely, which is very important for my analysis. No individual will be identified at any point. Please attach your current CV with publications to the completed questionnaire. This will help me to analyze research productivity in all possible angles so that the out come of the study will be much accurate and useful for research administrators and policy makers. As such, submission of the questionnaire only, will not be of much use.

This questionnaire will not take more than 20 minutes and please submit it to me on or before 15.10.2002. Further, if any one of you wants any help from the NSF in future, you are most welcome to contact me and I will try my best to help you at my capacity.

Thanking you for kind cooperation and early attention.

Yours sincerely,

Seetha Wickremasinghe
Senior Scientific Officer
Questions asked during the direct interviews

(Note: For each interview, depending on the field of specialization and current work handled by the interviewee, different questions were selected from the following)

**Questions relevant to NARS in India**

* Do you think further expansion of NARS in India is necessary?
* Do you think that NARs in India is a successful system compared to other countries in the region?
* Are you happy with the freedom given to scientists in NARS in regard to their work?
* What are the reorganizations of ICAR or NARS in general have been taken place after Gadkar Committee recommendations in 1973?
* What is the specialty of the Land Grant Pattern agricultural university system?
* Are there any linkages of ICAR/NARS with other general universities doing agricultural research?
* Do you think that there is a possibility of further expansion of SAUs?
* What are the reorganizations of NARS in India?
* Do what extent do you think that decentralization of NARS should take place?
* Is the linkage among scientists in ICAR institutes, SAUs and extension satisfactory?
* Do you think that enough autonomy has been given to ICAR institutes?
* Are there any difference in the salary scales among scientists in research, education and extension?
* Is there any quality difference among the SAUs spread all over India?
* What is the role of ICAR relevant to extension?
* What do you mean by frontline extension?
* What are the main programmes conducted by ICAR under frontline extension?
* What is the objective of the IVLP handled by ICAR?
* What is the main source of ICAR that link research and extension?
* What is the specialty of the All India Coordinated Research Projects?
* Is the promotion scheme in ICAR institutes and SAUs common?
* Are there any personnel policies established for scientists in the ICAR system?
* What are the steps taken by the ICAR to develop human resource capabilities?
* What are the services done by the KVKs?
* What is your view on “publish or perish” criterion for scientists?
* Is publication of research by scientists mandatory and are they counted for promotions?
* Do you prefer to publish in the international Journals?
* What are the barriers you think for publication of research?
* Are the scientists transferable within the system?
* Is there any difference in the mandate of CRRI and DRR?
* Are there any overlapping of rice research in CRRI and DRR?
* What are the responsibilities of the project directorates?
* When was the rice genome project established at IARI?
* Are there any other institutes or universities, which handle rice genome research?
* What are the major research activities handled by the rice genome project?
* Do you have adequate facilities to conduct rice genome research?
* Do you have enough qualified scientists to work in the rice genome project?
* What are the advanced rice research technologies conducted in India?
* What are the universities and research institutes conducting transgenic rice research?
* How many groups of scientists are currently handling the transgenic rice research?
* Do you think that people will accept transgenic rice when there is much controversy over Bt crops?
* Are you aware of any studies done or being done on the long-term effects of GM foods?
* Can you elaborate on the golden rice project to be conducted in India?
* What are the institutes and the universities that will take part in the golden rice project?
* Why do you think that developing golden rice is important to India?
* Are you in general happy with the NARS in India?
* What are the positive points as you see in the NARS in India?
* What are the negative points as you see in the NARS in India?

Contd...
Questions relevant to NARS in Sri Lanka

* What is your view on NARS coming under several Ministries in Sri Lanka and would it be better if the institutes belong to NARS come under the Ministry of Agriculture?
* Is there proper coordination among the Ministries under which the agricultural institutes come?
* Are there any linkages among the different Ministries in regard to rice research?
* To what extent the Ministry of Science and Technology involved with the agricultural scientists in the university?
* Do you think that the NARS in Sri Lanka is politically much influenced?
* What is your view on agricultural research policy in Sri Lanka?
* Are you happy with the infrastructure facilities for agricultural research in the country?
* Are there financial constraints for research in your institute?
* What are the other sources or agencies that provide funds for agricultural research?
* Has CARP been efficient in linking all the institutions under NARS?
* Do you think that CARP be expanded for efficient functioning and if so, what are your suggestions?
* Does CARP give priority to agricultural research in the universities?
* Do you think that the agricultural research community in Sri Lanka is properly organized?
* Do you think that the agricultural research community is well recognized by the government?
* In your opinion what is the field in agriculture that that has contributed to the country mostly?
* Is there proper linkage among research, education and extension in the NARS in Sri Lanka?
* Is there any linkage of research between the DOA and universities relevant to agriculture?
* Is there proper linkage between research and extension in the DOA?
* What are the schemes adopted in the NARS for reward and recognition of the agricultural scientists?
* Is there any national awards system to recognize agricultural scientists?
* Are the personnel policies relevant to agricultural scientists in the NARS satisfactory?
* Is HRD of agricultural scientists in the system properly planned?
* What is your view on training more agricultural scientists in neighbouring countries like India?
* Do you think that ad hoc transfers among the research institutes in the DOA hinder the progress of research?
* What is your view having at least one agricultural university in the country?
* Do you have enough staff for teaching in the Agriculture Faculties?
* Are there adequate funds to train teaching staff in the agricultural faculties?
* Do you think that publication of agricultural research is satisfactory in Sri Lanka?
* If not, what are your suggestions to promote publication of agricultural research?
* Do think that publication of research should be the criterion for promotions?
* Do you agree to the fact that publication of research helps for recognition as a scientific community?
* Are there enough journals in Sri Lanka for publication of agricultural research?
* Are there any reasons as to why the scientists are not keen to publish their results?
* Are there any difficulties in publication of agricultural research?
* Are there any agricultural societies in Sri Lanka?
* Are there any recognized professional agricultural bodies in Sri Lanka?
* Are you happy about the promotional aspects of the scientists in the NARS?
* Are you happy about the prevailing salary structure of the agricultural scientists in the country?
* What is your view on conducting advanced research like biotechnology in the agricultural research?
* Is there any satisfactory out come in regard to biotechnological research in agriculture?
* Are you aware of such technologies being used at field level in Sri Lanka?
* What is your view on importing and adapting them suitable to our country?
* What are the advanced technologies conducted in rice research in Sri Lanka?
* What are the biotechnology researches conducted in rice at the moment?
* Is there proper linkage relevant to rice research between the RR&DI and the universities?
* What are the constraints for RR&DI for speedy progress?
* What is your view on developing transgenic or GM rice for consumption?
* What are the reasons for transfer of technologies in agriculture has not been successful in Sri Lanka?
* Are you in general happy with the NARS in Sri Lanka?
* What are the positive points as you see in the NARS in Sri Lanka?
* What are the negative points as you see in the NARS in Sri Lanka?
List of scientists took part in the direct interviews (India) during 2002-2003

1 DDG/ Education – ICAR
2 DDG/ Extension – ICAR
3 ADG/ Crop Science – ICAR
4 Chairman/ M.S.Swaminathan Foundation Institute
5 Principle Scientist – Krishi Bhawan/ ICAR
6 Director – CRRI/ Cuttack
7 Joint Director – CRRI/ Cuttack
8 Head/ Plant Breeding & Genetics – CRRI/ Cuttack
9 Head/ Plant Pathology – CRRI/Cuttack
10 Head/ Agricultural Engineering – CRRI/Cuttack
11 Principal Scientist – NCAP/ ICAR
12 Principal Scientist – NCAP/ ICAR
13 Senior Scientist – NCAP/ ICAR
14 Director – NCPGR/ New Delhi
15 Principal Scientist – NCPGR/ New Delhi
16 Senior Scientist – Rice Genome Project/ IARI
17 Professor, NRC on Plant Biotechnology/ IARI
18 Principal Scientist – NBPGR/ New Delhi
19 Principal Scientist – ICGEB/ New Delhi
20 Senior Scientist – NISTADS/ New Delhi
21 Principal Scientist – Plant Health Clinic/ IARI
22 Principal Scientist – NAARM/ Hyderabad
23 Principal Scientist – NAARM/ Hyderabad
24 Associate Professor – Andra Pradesh Agricultural University
25 Associate Professor – Panjab Agricultural University
List of scientists took part in the direct interviews (Sri Lanka) during 2002-2003

1. Executive Director/ CARP, Colombo-07.
2. Director/ PGIA, University of Peradeniya. *
3. Vice Chancellor, University of Ruhuna, Matara.
4. Director/ RR&DI, Batalagoda.
5. Principal Scientist, RR&DI, Batalagoda.
6. Principal Scientist, RR&DI, Batalagoda.
7. Principal Scientist, RR&DI, Batalagoda.
8. Emeritus Professor/ Crop Science, University of Peradeniya
9. Emeritus Professor/ Agric. Economics, University of Peradeniya
10. Director/ HORDI, DOA, Peradeniya.
11. Director/ PGRC, DOA, Peradeniya.
12. Director/ DEA, Peradeniya
13. Former Director General (i)/ Peradeniya
14. Former Director General (ii)/ Peradeniya
15. Director/ TRI, Talawakele
16. Deputy Director (Research)/ RRI, Agalawatta
17. Professor/ Faculty of Agriculture, Rajarata University, Mihintale
18. Professor/ Faculty of Agriculture, University of Ruhuna, Matara
19. Senior Scientist/ Veterinary Research Institute, Peradeniya.
20. Former DDG/ NARESA, Colombo-07.
22. Senior Scientist, DOA, Peradeniya.
23. Senior Scientist, CRI, Lunuwila.
24. Director (Admin.)/ Institute of Post Harvest Technology Institute, Anuradhapura.
25. Senior Scientist/ Institute of Post Harvest Technology Institute, Anuradhapura.

* Also the Chairman/ NSF Research Committee on Agriculture
GOVERNMENT OF INDIA  
SCIENTIFIC POLICY RESOLUTION  
New Delhi, the 4th March 1958/13th Phalguna, 1879

Appendix 4.1

No. 131/CF/57 - The Key to national prosperity, apart from the spirit of the people, lies, in the modern age, in the effective combination of three factors, technology, raw material and capital, of which the first is perhaps the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources, and reduce the demands on capital. But technology can only grow out of the study of science and its application.

2. The dominating feature of the contemporary world is the intense cultivation of science in a large scale, and its application to meet country's requirements. It is this, for the first time in man's history, has given to the common man in countries advanced in science, a standard of living and social and cultural amenities, which were once confined to a very small privileged minority of the population. Science has led to the growth and diffusion of culture to an extent never possible before. It has not only radically altered man's material environment, but what is of still deeper significance, it has provided new tools of thought and has extended man's mental horizon. It has thus influenced the basic values of life, and given to civilization of a new vitality and a new dynamism.

3. It is only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every member of the community, and it is out of recognition of this possibility that the idea of a welfare state has grown. It is characteristic of the present world that the progress towards the practical realization of a welfare state differs widely from country to country in direct relation to the extent of industrialisation and the effort and resources applied in the pursuit of science.

4. The wealth and prosperity of a nation depend on the effective utilization of its human and material resources through industrialisation demand its education in science and training in technical skills. Industry opens up possibilities of greater fulfillment for the individual. India's enormous resources of manpower can only become an asset in the modern world when trained and educated.

5. Science and technology can make up for deficiencies in raw materials by providing substitutes, or, indeed, by providing skills which can be exported in return for raw materials. In industrialising a country, a heavy price has to be paid in importing science and technology in the form of plant and machinery, highly paid personnel and technical consultants. An early and large-scale development of science and technology in the country could therefore greatly reduce the drain on capital during the early and critical stages of industrialisation.

6. Science has developed at an ever-increasing pace since the beginning of the century, so that the gap between the advanced and backward countries has widened more and more. It is only by adopting the most vigorous measures and by putting forward our utmost effort into the development of science that we can bridge the gap. It is an inherent obligation of a great country like India, with its traditions of scholarship and original thinking and its great cultural heritage, to participate fully in the march of science, which is probably mankind's greatest enterprise today.

7. The Government of India have accordingly decided that the aims of their scientific policy will be-

(i) to foster, promote and sustain, by all appropriate means, the cultivation of science, and scientific research in all aspects - pure, applied, and educational;

(ii) to ensure an adequate supply, within the country, of research scientists of the highest quality, and to recognize their work as an important component of strength of the nation;

(iii) to encourage, and initiate with all possible speed, programmes for the training of scientific and technical personnel, on a scale adequate to fulfill the country's needs in science and education, agriculture and industry, and defense;

Contd-
(iv) to ensure that the creative talent of men and women is encouraged and finds full scope in science activity;

(v) to encourage individual initiative for the acquisition and dissemination of knowledge, and for the discovery of new knowledge, in an atmosphere of academic freedom;

(vi) and, in general, to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge.

The Government of India have accordingly decided to pursue and accomplish these aims by offering good conditions of service to scientists and according them an honoured position, by associating scientists with the formulation of policies, and by taking such other measures as may be deemed necessary from time to time.
Appendix 5.1

ICAR directly administers 49 research institutes in the area of crop, animal and fishery sciences. Given below is a brief account on these institutes.

1. Central research institutes

1.1 Research management academy

The National Academy of Agricultural Research management (NAARM), originally started as Central Staff College for Agriculture, at Hyderabad, provides research management training to the agricultural scientists in the country. In addition, it organizes seminars, conferences and workshops, both national and international based upon the scientific studies and reviews undertaken on the management problems encountered in the research system. It publishes training materials and functions as a repository of information in the field of agricultural research and education management. Besides meeting national needs as a premier management institution, the academy has no developed an institutional capability to act as a Regional Training Centre in this part of the world.

1.2 National bureaux

In order to collect, conserve and initiate such measures as would lead to long-term productivity of basic resources like plants, animals, fish, soil and water, the ICAR has established four national bureaux. They are:

National Bureau of Plant Genetic Resources (NBPGR) at New Delhi undertakes research and coordinates activities in germplasm collection; introduction and exchange of seeds and plant material; characterization, documentation, maintenance and conservation of genetic resources for utilization in crop management.

National Bureau of soil survey & Land Use Planning (NBSS&LUP) at Nagpur is engaged in the preparation of soil map of India; preparation of district level soil resource inventories; soil correlation at national level; research in soil genesis and classification; imparting in training of soil survey and mapping; soil taxonomy, land use planning etc. and establishment of soil data bank for use in agricultural research and extension.

National bureau of Animal Genetic Resources (NBAGR) at Karnal is engaged in the collection, maintenance and conservation of animal genetic resources for utilization in livestock improvement.

National bureau of fish genetic resources (NBFGGR) at Lucknow is engaged in the collection, conservation and efficient utilization of fish genetic resources.

Contd...
1.3 Crop science institutes
There are nine crop science institutes carrying out basic and applied research on specific crops and transferring the results thereof. They are:

Indian Agricultural Research Institute (IARI) at New Delhi is the premier agricultural institution engaged in basic and applied research in crops, postgraduate education and training, extension education and transfer of technology. It has Deemed University status and awards postgraduate degrees in various disciplines of crop science.

Central Rice Research Institute (CRRI) at Cuttack is engaged in basic and applied research in all disciplines of rice culture; in the generation of information for planning adaptive research; serving as a center of information on all matters concerning rice production, protection and conservation.

Central Research Institute for Jute and Allied Fibres (CRIJAF) at Barrackpore is engaged in developing varieties of jute suitable for different jute growing areas; in developing appropriate crop management and crop protection technology including broad type farm tools and implements for jute and allied fibres; and in the protection of breeder and foundation seeds of jute.

Central Tobacco Research Institute (CTRI) at Rajahmundry is engaged in varietal improvement of FCV tobacco; in pest and disease management; in the improvement of curing technology; in the utilization of tobacco wastes and in extension education.

Indian Grassland and Fodder Research Institute (IGFRI) at Jhansi carries out basic and applied research on grasses, grasslands and fodder crops including all aspects of forage seed production and its protection for producing high quality forage. It also attempts to develop and evaluate various crop/tree species combinations for silvi-pasture and agro-forestry systems.

Sugarcane Breeding Institute (SBI) at Coimbatore is engaged in evaluating imported sugarcane varieties for different agro-climatic regions in the country. It conducts research on breeding methodologies by taking advantage of its situational factor favourable for the flowering of sugarcane crop. It also imparts postgraduate training.

Indian Institute of Sugarcane Research (IISR) at Lucknow has the mandate to standardize the sugarcane production and protection technologies; to devise and develop prototype of machines and implements require to promote the interest of sugarcane cultivation for maximum economic benefits to the farmers; to provide advisory services; and to impart training in sugar crops and agroi-techniques.

Central Institute for Cotton Research (CICR) at Nagpur is engaged in basic and applied research to improve cotton production; in the collection and conservation of germplasm for cotton improvement programmes; and imparting training in advanced cotton protection technology.

Vivekananda Parvatiya Krishi Anushandhan Shala (VPKAS) at Almora is engaged in the development of improved high yielding and disease resistant varieties of different cereals, millets, pulses, vegetables and fodder crops grown in hills; collection, evaluation and maintenance of germplasm resources of hill crops and identification of suitable improved cropping systems for these areas; and conduct research on soil and water management problems and transfer research results for the benefit of farmers of hilly areas.
1.4 Horticulture and Plantation Crops Institutes:
There are six horticulture and plantation crops institutes conducting and coordinating research on the crops they deal with. They are:

Indian Institute of Horticultural Research (IIHR) at Bangalore has the mandate to conduct cytogenetical studies to improve horticultural crops; standardize propagation techniques, nutritional growth regulators in horticulture; physiology and biochemistry for flower and fruit development; control of weeds; viral, fungal and bacterial diseases, mites and pests; post harvest technology; design of tools and implements and conservation of germplasm.

Central Institute of Horticulture for Northern Plains (CIHNP) at Lucknow is engaged in the investigation of major production problems of fruit and vegetable cultivation for the northern plains with special reference to mango.

Central Institute of Temperate Horticulture (CITH) at Lucknow at Srinagar has mandate to carry out basic and applied research related to temperate fruits and vegetables in the country.

Central Potato Research Institute (CPRI) at Shimla has the mandate to conduct and coordinate potato research in India; to serve as a centre for information in all aspects of potato research and development; and to produce breeder seeds required by the country.

Central Tuber Crops Research Institute (CTCRI) at Trivandram conduct and coordinate research on all tropical tuber crops other than potato, viz. cassava, sweet potato, amorphophallus, aroids, yams, arrowroot etc.

Central Plantation Crops Research Institute (CPCRI) at Kasargod has the mandate to improve the genetic potential of plantation crops; conduct basic and applied research; serve as an information centre for all matters relating to these crops; and produce genetically superior planting materials.

1.5 Resource management institutes
There are eight resource management institutes, which are primarily responsible for understanding research on soil and water conservation for optimizing production of crops under different conditions. They are:

Central Soil and Water Conservation Research and Training Institute (CSWCR&TI) at Deheradun has the mandate to study erosion problems and conservation of land and water resources; evaluation of hydrological barriers and management of watersheds; identification of suitable plant material for different land use; development of suitable technology for increasing production from arid lands; development of technologies for rain-fed farming and efficient water management; imparting training to State and Central officers in soil and water conservation; and monitoring of changes in environment affected by integrated water management.

Central Soil Salinity Research Institute (CSSRI) at Karnal has the mandate to collect information on the extent, characteristic, genesis and classification of salt affected soils; study soil and water dynamics in irrigated agriculture; conduct detailed hydrological survey; evolve methods to check deterioration of water due to pollution, and utilization of different qualities for agricultural purposes; study salt tolerance for reclamation of salt affected land; and impart education and training.

Contd...
Central Arid Zone Research Institute (CAZRI) at Jodhpur has the mandate to evolve location specific technologies for optimizing production of arid lands based on ecological principles by judicious utilization of natural resources; and to train and to conduct workshops for adopting the new technologies.

Central Research Institute for Dry land Agriculture (CRIDA) at Hyderabad has the mandate to carry out basic research in conservation, management and utilization of natural resources in dry land ecosystem; to study the phenomenon governing crop growth and development under dry land conditions; to develop technology for exploitation of natural resources at farm level for increasing and stabilizing for crop production in dry land and also to act as a repository of knowledge on dry land farming in the country. h Complex for North-Eastern Hill Region.

ICAR Research Complex for North-Eastern Hill Region (ICAR-NEH) at Shilling caters to the needs of agriculture, animal husbandry, fisheries, soil and water conservation etc., for the hill areas of the north-eastern region with a major research focus on shifting cultivation, horticultural crops, pest management, livestock improvement, arid soil management and post harvest technology.

ICAR Research Complex for Goa (ICAR-GOA) at Ela is engaged in research related to horticultural and other crops, livestock improvement, fisheries etc. in the region.

Central Agricultural Research Institute (CARI) for Andaman and Nicobar islands at Port Blair conduct research on high value plantation and cash crops; develops silvipastoral system and appropriate land use pattern through cropping systems; develops effective health coverage and livestock production systems and conduct studies on capture and culture fisheries including coastal aquaculture.

Indian Institute of Soil Science (IISS) at Bhopal has the mandate to study the fundamental aspects of soils, particularly those that are basic to develop agricultural expertise and generate information on various basic aspects of soil research; to collaborate with other organizations to identify gaps and provide direction for further research; and to have collaboration with similar international research institutions.

1.6 Technological institutes
The technological and engineering problems in crop production and quality of commercial crops are handled by five institutes. They are:

Central Institute of Agricultural Engineering (CIAE) at Bhopal has the mandate for research and development of improved farm equipment related to crop production; post harvest technology; development of energy resources and power units for agriculture; to liaise with industry for the manufacture of improved implements; and to train farmers on modern agricultural technology.

Central Institute for Research and Cotton Technology (CIRCT) at Bombay has the mandate to improve the production of quality cotton; and to fine ways and means for better utilization of quality cotton and its by-products.

National Institute of Research on Jute and Allied Fibre Technology (NIRJAFT) at Calcutta has the objectives of improvement of fiber quality; preparation of textiles by blending jute and other fibres; basic research on fibres and products; and transfer of technology for application in agriculture and industry.

Contd...
Indian Lac Research Institute (ILRI) at Ranchi carries out research towards, effecting improvements in cultivation, modification and standardization of lac, and study its constitution and modification so as to intensify its production and utilization; and to impart training in improved methods of lac cultivation and its industrial use.

Central Institute of Post-harvest Engineering and Technology (CIPET) at Ludhiana undertakes research on various aspects of post-harvest technology related to agricultural produce.

1.7 Animal Science Institutes:
Eight animal science institutes have the mandate of breeding animals for higher productivity and suggest better management practices. They are:

Indian Veterinary Research Institute (IVRI) at Izatnagar, a Deemed University, has its objectives to conduct basic and applied research on all aspects of livestock health, production and nutrition; and impart postgraduate education in veterinary sciences and animal husbandry.

National Dairy Research Institute (NDRI) at Karnal, a Deemed University, has the mandate to meet the manpower needs for research, teaching and dairy development through undergraduate and postgraduate instructional programmes; study of dairy production, milk and milk processing, dairy economics and management; and conduct of transfer of technology programmes.

Central Sheep and Wool Research Institute (CSWRI) at Avikanagar has the mandate to improve productivity of indigenous breeds of sheep through selection or cross breeding, superior exotic breeds well adapted to the tropical conditions to improve the carpet, wool and meet production.

Central Institute for Research on Goats (CIRG) at Markdoom undertakes research for developing superior strains of goat for high productivity of milk, meat and fibre; to develop package of practices for feeding, management and disease cover; and to study various aspects of goat meat, milk and pashmina.

Central Avian Research Institute (CARI) at Izatnagar has the objectives to develop avian species of economic importance with optimum productivity; to console, evolve and improve indigenous and exotic germplasm; to impart training at various levels; to transfer the technology developed; and to undertake studies on various aspects of management to evolve environmental and ecological factors of post-harvest technology.

Central Institute for Research on Buffaloes (CIRB) at Hissar carries out research on all aspects of Buffalo production; coordinate research on buffalo in the country; functions as a clearing house of information on all aspects of buffalo development; establishes a nucleus breeding herd of important buffalo breeds for genetic studies for improvement of milk, meat and draught potential; builds up adequate germplasm of improved breeds; and organizes training programmes in buffalo management.

National Institute of Animal Genetics (NIAG) at Karnal provides scientific support to the NBAGR and takes up research work of very fundamental nature not ordinarily taken up at the existing ICAR Institutes and Agricultural Universities.

National Institute of Animal nutrition and Physiology (NIANP) at Bangalore conducts research related to nutritional and physiological aspects of livestock and management.

Contd...
**1.8 Fisheries Institutes:**
Six fisheries institutes conduct studies for assessing the production of fish, conduct training programmes and undertake research. They are:

**Central Inland Capture Fisheries Research Institute (CICFRI) at Barrackpore** has the mandate to develop systems for monitoring of fish population in rivers, freshwater reservoirs, estuaries, and to study factors influencing these population and systems for optimum exploitation; and to conduct postgraduate and specialized training and extension programmes.

**Central Marine Fisheries Research Institute (CMFRI) at Cochin** conducts research for assessing and monitoring exploitable marine fishery resources for rational exploitation and conservation; to assess the exploited and under-exploited fishery resources; to understand the fluctuation in abundance of marine fishery resources; to develop suitable mari-culture technology for fun fish and shell fish in open seas; to conduct transfer of technology and postgraduate and specialized short-training programmes.

**Central Institute of Fisheries Education (CIFE) at Bombay** has the Deemed University status. It conducts undergraduate and postgraduate degree programmes in fishery sciences; undertakes research in basic disciplines related to fish and conducts short-term and long-term training programmes for different disciplines of fishery sciences.

**Central Institute of Fisheries Technology (CIFT) at Cochin** conducts research for the improvement of indigenous crafts and gears, and develops suitable designs for them; develop technologies for handling, processing, preservation, product development, quality control, packaging and transportation of fish and fishery products; and conducts transfer of technology and training programmes in fishery technology.

**Central Institute of Brackish-water Aquaculture (CIBA) at Madras** conducts multidisciplinary, mission oriented applied research to develop appropriate technologies for the aquaculture organisms in the estuaries, brackish-water and salt intrusion areas; and to provide an information base for sustained growth and accelerated development of these fisheries through training, education and research linkages.

**Central Institute of Freshwater Aquaculture (CIFA) at Dhauli** conducts research for developing low input aqua-farming to benefit small and marginal farmers and also system of industrialized aquaculture for entrepreneurs; to improve existing technology for carps and air-breathing fish culture, and develop culture technology for cat fish, freshwater prawns and mussels; to increase freshwater fish production through genetic upgrading, increased pond productivity and evolution of cheap and balanced diet; to conduct nutritional and disease aspects of fish culture; and to conduct postgraduate education and training programmes.

**1.9 Social science institutes:**
Two institutes come under this category. They are:

**Indian Agricultural Statistics Research Institute (IASRI) at New Delhi** conducts research in experimental design, surveys, statistical genetics, computer and data processing; imparts postgraduate courses for training professional statisticians; and provides advisory and consultancy services to agricultural scientists in the country.

**National Centre for agricultural Economics and Policy Research (NCAP) at New Delhi** has the objectives to undertake research related to the economic aspects of agricultural production process including the associated policy issues.
**List of Agricultural Universities in India**

1. Acharya N G Ranga Agricultural University, Hyderabad (Andra Oradesh)
2. Aligarh Muslim University, Aligarh
3. Assam Agricultural University, Jorhat (Assam)
4. Banaras Hindu University, Varanasi (Uttar Pradesh)
5. Bidhan Chandra Krishi Vishva Vidyalaya, Mohanpur, (West Bengal)
6. Birsa Agricultural University, Ranchi (Bihar)
7. Chandrasekar Azad University of agriculture and Technology, Kanpur (Uttar Pradesh)
8. Chaudhary Charan Singh Haryana Agricultural University, Hisar (Haryana)
9. Dr Panjabrao Desmukh Krishi Vidyapeeth
10. Dr Yashwant Singh Parmar University of Horticulture and Forestry, Nauni (Himachal Pradesh)
11. Govind Ballabh Pant University of Agriculture and Technology, Pantnagar (Uttar Pradesh)
12. Gujarat Agricultural University, Sardar Krushinar (Gujarat)
13. Himachal Pradesh Krishi Vishwa Vidyalaya, Palampur (Himachal Pradesh)
14. Indira Gandhi Krishi Vishwa Vidyalaya, Raipur (Madhya Pradesh)
15. Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (Madhya Pradesh)
16. Kerala Agricultural University, Vellanikkara (Kerala)
17. Konkan Krishi Vidyapeeth, Dapoli (Maharashtra)
18. Mahatma Phule Krishi Vidyapeeth, Rahuri (Maharashtra)
19. Marathwada Agricultural University, Parbhani (Maharashtra)
20. Narendra Deva University of Agriculture and Technology, Faizabad (Uttar Pradesh)
21. Orissa University of Agriculture and Technology, Bhubaneswar (Orissa)
22. Punjab Agricultural University, Ludhiana (Punjab)
23. Rajasthan Agriculture University, Bikaner (Rajasthan)
24. Rajendra Agriculture University, Samastipur, Pusa (Bihar)
25. Sher-e-Kashmir University of Agricultural Sciences and Technology, Sirinagar (Jammu Kashmir)
26. Tamil Nadu Agricultural University, Coimbatore (Tamil Nadu)
27. Tamil Nadu Veterinary and Animal Sciences University, Chennai (Tamilnadu)
28. University of Agricultural Sciences, Bangalore (Karnataka)
29. Viswa Bharathi Santiniketan, West Bengal
30. West Bengal University of Animal and Fishery Sciences, Calcutta (West Bengal)

**Central University**
31. Central Agricultural University, Imphal (Manipur)

**Deemed -to-be Universities**
32. Allahabad Agricultural University, Allahabad (Uttar Pradesh)
33. Indian Agricultural Research Institute, Pusa (New Delhi)
34. Indian Veterinary Research Institute, Izatnagar (Uttar Pradesh)
35. National Dairy Research Institute, Karnal (Haryana)
36. Central Institute of Fisheries Education, Mumbai (Maharashtra)

Source: Annual Report 2001/2002, Department of Agricultural Research and Education
New Delhi.
The important events taken place in the development of agricultural extension in India

Community Development

1952  Community Development Programme
1953  National Extension Service
1954  Community Development Block
1957  Democratic Decentralization

Technological Development

1960  Intensive Agricultural Development Programme
1964  Intensive Agricultural Area Programme
1960-65 Intensive Cattle Development Programme
1966  High Yelling Variety Programme

Development With Social Justice

1970-71 Small Farmers Development Agencies
         Marginal Farmers and Agricultural Labourers
         Drought Prone Area Programme
1972-73 Pilot Project for Tribal Development
1974  Training and Visit Programme
1977-78 Desert Development Programme
1978-79 Integrated Rural Development Programme
1979  Training of Rural Youth for Self-employment
1980  National Rural Employment Programme
1982  Development of Women and Children in Rural Areas
1983  National Agricultural Extension Project
1986  Technology Mission on Oil Seed
1992  Scheme for Rural Artisans
1993  Jawahar Rozgar Yojana
1993  Employment Assurance Scheme
Agriculture based R&D organizations located in different Ministries of the GOSL
Source: Senanayake, (2000)
The research institutions Coming under the DOA (Sri Lanka)

1. **Field Crops Research and Development Institute (FCRDI):**

   Situated at Maha Illuppallama in the dry zone of Sri Lanka, the FCRDI has recognized that farming system approach is the most efficient method to improve the productivity of different farming situations and is working towards developing sustainable farming systems for: (a) the rainfall uplands, (b) irrigated lowlands and (c) agro-well production systems in the dry zone of Sri Lanka.

2. **Horticultural Crops Research and Development Institute (HORDI):**

   Situated at Gannoruwa in the mid country of Sri Lanka, farming systems research activities are undertaken by HORDI with the participation of farmers. Emphasis is placed on interdisciplinary team work taking a historic approach to introduce economically viable, ecologically sound and socially acceptable new technologies to increase farm productivity, farmer's income and improve livelihood of farmers, while maintaining or even enhancing the quality of environment and conserving natural resources.

3. **Rice Research and Development Institute (RR&DI):**

   Situated at Batalagoda in the intermediate zone of Sri Lanka, RR&DI deals exclusively with farming systems research that involves maximizing profitability and production sustainability in farm units where rice is the sole crop. RR&DI also undertakes several adaptive research programmes, which have an indirect relevance to farming systems research through testing adaptability of improved technology over varying rice-farming situations.

   Among other non-plantation crop research units, the FTRU, FMRC, NRMC, PGRC, SEPC etc., could be considered as the supporting institutions to the sister organizations of the DOA and their functions are, therefore, centralized to enable them to serve all such bench research organizations.
The establishment of the Agricultural Research Service (ARS)
For the scientists of ICAR (02 October 1975)

Summary of the objectives:

1. Foster co-operation in the place of unhealthy competition

2. Enable scientists to get the highest salary possible within the system while remaining rooted to work in their respective discipline/field, thereby both the undue importance attached in the past to research management posts and the quest for such positions purely for advancement of salary.

3. Promote an outlook where solving a specific field problem through interdisciplinary team work is regarded as the primary goal of research instead of the worship of a discipline or publication of papers.

4. Promote horizontal and vertical mobility and adequate attention to neglected and backward areas.

5. Link rights and responsibilities and instill through the five-year assessment system the conviction that dedicated and efficient discharge of responsibilities alone would be the means of securing professional advancement.