

Farmer FIRST

Enriching Knowledge - Integrating Technology



Division of Agricultural Extension
Indian Council of Agricultural Research
New Delhi-110 012, India

Project Framework

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Indian Council of Agricultural Research
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Editors

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शरद पवार

SHARAD PAWAR



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भारत सरकार
MINISTER OF AGRICULTURE &
FOOD PROCESSING INDUSTRIES
GOVERNMENT OF INDIA

29 January, 2013

MESSAGE

I am delighted to know that ICAR is going to launch a project namely 'Farmer FIRST' with connotations and focus on Farmers' Farm, Innovations, Resources, Science and Technology. Farmers are engaged in farming since ages and the knowledge and skills practiced by them are outcome of their traditional knowledge, trials and analysis of experiential learning over time. The post independence scientific developments have given a new dimension to technology generation for Indian agriculture, but still farmers' tacit knowledge, wisdom, innovations, feedback and socio economic perspectives have lot of value in the context of its adaptability to specific agro-ecological situations.

It is hoped that the proposed project will engage scientists of ICAR Institutes and Agricultural Universities to undertake technology application directly in active partnership and blending the knowledge base of farmers. The project would also bring perceptual change among scientists to realize ground realities and develop technologies as per needs of farming community at large, enhance farmers - scientists' interface and enrich knowledge of all stakeholders. Farmers are primarily concerned with economic survival and seek practical answer to their field problems and local issues, while scientists do not always consider the farmers frame of reference when developing solution to a problem. I think the research findings should be practically applicable and scientifically sound as well as being affordable by farmers. It is hoped that such concerns of farmers will be taken care while implementing the 'Farmer FIRST' Project.

I wish all success to this endeavor of ICAR.

(Sharad Pawar)

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Secretary, DARE &
Director General, ICAR

Dr. S. Ayyappan


FOREWORD

The farmers have been exploring new farming methods for thousands of years, but National Agricultural Research System (NARS) is mandated to bring the principles of modern scientific farming to their aid. The NARS with its vast network of institutions and collaborations is striving for developing technologies techniques, practices, processes, tools and implements for different natural resource endowments of the country. India has variety of diversity in terms of agro-ecological and socio-economic settings largely inhabited by majority of small farm holders. Indian agriculture has to concentrate on food and nutritional security for masses; optimal harnessing of natural resource base; and bring about economic empowerment of farmers ensuring equity, sustainability and higher productivity of various production systems. The success of scientific outputs of NARS greatly depend upon its suitability to location specific situations and requirements. The assessment of adaptability of research outputs on real time basis in actual farm conditions and with active involvement of farmers is of paramount importance to build an environment of mutual learning for enhanced technology application and its assimilation in farming system.

The agricultural research has to march hand in hand with the farmers for their techno-economic empowerment. To address this issue, the ICAR is keen to foster an environment for change in the perception and priority of scientists as per ground realities. The 'Farmer FIRST' project has been conceived as farmer centric instrument to identify, prioritize and experiment with focus on farmers' farm, innovations, resources, science and technology. A menu of actions proposed for 'Enriching Knowledge and Integrating Technology' with enhanced farmers - scientists interactions is the main motive of this project. The approach proposed in the project draws on and balances two social paradigms - an interactive paradigm centered on appreciation of farmers prospective and a functional paradigm capitalized on researchers experience of working with farmers to take a stock of suitability of the technologies by experimenting in farmers field.

It is envisaged that project will provide a platform of creating linkages, capacity building, technology adaptation and application, on-site input management, feedback and institution building. With insights of experimentation with and for the farmers. I am sure, it will be quite fascinating for researchers to work in challenging but real production systems operated by farmers.

New Delhi
January, 2013


(S. Ayyappan)

Dr. M. MAHADEVAPPA

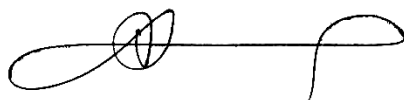
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ACKNOWLEDGEMENT

I, on behalf of the Committee constituted for developing modalities for Farmer FIRST Project, would like to express gratitude to Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR for constituting the Committee and providing insights and the context in which the project was required to be developed. We also express our sincere thanks to Dr. K.D. Kokate, Deputy Director General (Agril. Extn), ICAR for his unstinted support and participation in various deliberations. We record our gratitude to the farmers who deliberated on various issues and provided the required ideas for developing the Project. The committee also thanks Vice-Chancellors, Directors of ICAR Institutes and faculty for providing their invaluable views for fine tuning the project outline. Thanks are also due to Dr. A. K. Singh, Zonal Project Director, Zone - IV and Member Secretary of the Committee for full support in organizing various meetings and preparation of this report. In the considered opinion of the Committee, the implementation of this report will enhance the grass root capacities for technology development, assessment and refinement, promote farmers-scientists interface and enable NARS system to respond better to stake holders' demands.



(M. Mahadevappa)
Chairman
Farmer FIRST Committee

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उप महानिदेशक (कृषि विस्तार)
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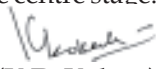


PREFACE

Farmers participatory approaches in agricultural research and extension over the years have shown remarkable results in field level technology application. This has happened because of due consideration given to knowledge, problems, priorities and needs of farming community in developing and designing research and extension programs.

Recognizing the importance of such considerations, the Indian Council of Agricultural Research (ICAR) has always been striving to bring scientists and farmers at one platform and provide opportunities to have feel of the ground realities so that the real issues could be identified and technology options are explored for wider acceptance by the farmers. Now, there is growing realization that the process of interaction, co-existence, co-working, partnerships, and convergence processes need to be further strengthened to ensure comprehensive and participatory role of stakeholders for inclusive growth in agriculture. With this context in view, ICAR constitute a Committee of eminent scientists under the Chairmanship of Dr. M. Mahadevappa with the terms of reference to provide a framework for active scientists-farmers for a Farmer-FIRST project implementation by ICAR institutes and selected Agricultural Universities.

For guiding and supporting a farmer centred initiative under National Agricultural Research System, we are grateful to Hon'ble Minister of Agriculture and Food Processing Industries and Secretary, DARE and Director General, ICAR. The Council is also thankful to the Committee for developing a framework of the project "Farmer FIRST : Enriching knowledge – Integrating Technologies" to be implemented during the XIIth plan. The report of the Committee has clearly outlined the objectives, design, structure, action plan and implementation, evaluation and monitoring mechanisms, which will serve as a guide for all the stakeholders who may be part of the project with different roles. It is hoped that the project will be a great success with enhanced interaction, participation, partnership and putting farmers at the centre stage.


(K.D. Kokate)

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1 EXECUTIVE SUMMARY

Indian Council of Agricultural Research has been striving for creating research base in the country for ensuring food and livelihood security to the masses. In order to reach to the ultimate users of the technology i.e. the farmers, the ICAR has pursued different approaches in the past like National Demonstration (1964), Lab-to-Land Programme (1979), Operational Research Project (1974-75), Technology Assessment and Refinement through IVLP (1995) ,etc. The past efforts provided close farmer-scientist linkages which enabled appropriate technology development and dissemination.

At present, it is realized that a mechanism is required by which researchers irrespective of their disciplines, could directly come into the contact of the farmers, study the ground realities and experiment on different priorities as perceived by the farmers which will be enabling capacity building of the farmers and also the research system to serve in the most appropriate way based on the feedback and innovations generated at farm level.

In response to emerging challenges, a Committee was constituted by the ICAR to develop the modalities for the Farmer FIRST project for its implementation by ICAR institutes and agricultural universities. The committee initiated interaction and dialogue with different stake holders including researchers, extension officials and the farmers in different parts of the country. The draft report is the outcome of different interactions and also the views expressed by the ICAR officials on different platforms.

The report consists of synthesis of past experimentations, the major aims and objectives, components, process and methodologies and checklist for project activities along with organizational chart, role of participating institutions and budgetary requirements for four years. **The proposed project is to be implemented by ICAR institutes and Agricultural Universities.**

The project will be implemented in research mode wherein PIs and Co-PIs will be identified in an institute who will be responsible for planning and implementation of the activities. However, there may be sub teams also in the institute to work on other special aspects and reporting to the main institute team.

The project focus will be on enriching knowledge and integrating technologies in the farmer's conditions and to enhance farmers-scientist interface. Emphasis of the project will be on farmers' farm, innovations, resources, science and technology. Small holders, landless and farm women will be specially addressed through technology integration modules.

The implementation and monitoring mechanism envisages decentralized, participatory and collaborative project planning, implementation and monitoring at different levels. **The farmer will be at the centre stage of the project.**

This project is unique in its approach which creates a **platform for all the scientists irrespective of their disciplines, to get an opportunity to regularly interact to the rural farm environment** and thus, collect valuable feedback on problems, priorities, opportunities and status of agriculture and agricultural technology at the ground level and develop suitable technology modules for different farm situations.

Since the project is entirely innovative in nature, **adequate care needs to be taken to facilitate understanding of the project in its spirit and operationalization of the entire Farmer FIRST process** for its implementation.

Appropriate HRD Process needs to be worked out for capacity building of the scientists to be involved in the process of project implementation.

2 METHODOLOGY

2.1 Constitution of Committee : A Committee was constituted by ICAR vide office order no 20-3/2011-AE-I dated 21 February, 2011 under the Chairmanship of Dr. M. Mahadevappa, former Chairman, Agricultural Scientists Recruitment Board. The Committee is as under.

- | | |
|---|------------------|
| 1. Dr. M. Mahadevappa, Former Chairman, ASRB, New Delhi | Chairman |
| 2. Dr. P.N. Mathur, Former DDG(Ag. Extn.), ICAR | Member |
| 3. Dr. P. Das, Former DDG (Ag. Extn), ICAR | Member |
| 4. Dr. S.L. Mehta, Former VC, MPUA&T, Udaipur | Member |
| 5. Dr. C.L. Acharya, Former Director, Indian Institute of Soil Science, Bhopal | Member |
| 6. Dr. M.L. Madan, Former VC, DU Pashu Chikitsa Vigyan Vishwa Vidyalaya Evam Go Anusandhan Sansthan, Mathura, Uttar Pradesh | Member |
| 7. Dr. A.K. Singh, Zonal Project Director Zonal Project Directorate, Zone-IV, Kanpur | Member Secretary |

Terms of reference : The terms of reference for the Committee were as under :

- i) To provide a frame work for active scientist - farmer interface with due incentives to researchers
- ii) To develop the modalities for Farmer FIRST project
- iii) Identification of number and location of centers in National Agricultural Research System (NARS)

2.2 Methodology and Approach

- i. The Committee had a task which required drawing of opinions from different stake holders including researchers, farmers and development officials. Involving researchers irrespective of their disciplines to take up experimentations in farmer's conditions was an important issue while developing the framework of the project.

- ii. In order to draw the opinions of farmers and researchers, deliberations were held at different places across the country (CSHKVV, Palampur - 24-25 May, 2011 : SKDAU, Dantiwada - 10-11 July, 2011 : CIFA Regional Station, Vijaywada - 13-14 August, 2011; ZPD, Kanpur - 2 Feb., 2012; NASC, New Delhi - 14-15 April, 2011, 28-29 May, 2011, 15-16 May, 2012, 20 June, 2012). The Committee conducted interaction workshops and meetings and presented the proposed framework of the project and subsequently views of all concerned were taken.
- iii. For wide circulation, the draft document was uploaded on ICAR website besides, sharing of project framework with Directors of all the ICAR institutes in Divisional Reviews conducted by ICAR.
- iv. The Committee also had discussions with Deans/Directors and Vice-Chancellors of CSHKVV, Palampur; SKDAU, Gujrat; TNAU, Coimbatore; CSAUAT, Kanpur in course of deliberations for finalization of report.
- v. The project outline was also shared with Secretary, ICAR as part of XIIth plan proposals. A presentation about the project outline was made in the Senior Officers Committee meeting chaired by Secretary, DARE and Director General, ICAR which was attended by all the Deputy Director Generals.
- vi. The project framework was presented to Secretary, DARE and DG, ICAR and DDG (AE) before its final submission.

3 BACKGROUND AND CONCEPTUALIZATION

3.1 Introduction

Indian agriculture embraces diverse actors in its endeavour to feed 1.21 billion people. The small, marginal and landless farmers are extremely vital for ensuring food security as the land holdings are shrinking day by day. The contribution of women farmers is also immense particularly in on farm operations, harvesting, post harvest management, savings and in other activities especially in horticulture and animal husbandry sectors. The ever increasing population, climate change, changing dietary habits are continuously putting pressure on agricultural sector. Farmers tend to get interested in farming when they get profit and regular assured income.

In today's scenario, innovation and technology form the key to address growing challenges in agriculture. Therefore, the innovations/technologies developed by scientists and farmers need to be identified, experimented and integrated. The innovation-development process consists of all the decisions, activities, and their impacts that occur starting from recognition of a need or problem, through research, development and its diffusion and adoption by users.

There are many agencies which are working at the field level with various kinds of public-private-farmers linkages. Earlier, transfer of technology (TOT), top down approaches, and later on participatory approaches and processes were focused. Partnerships and interactions are now seen more important. Partnerships like public-private, multi-stakeholder partnership, etc. and collaborations like co-management, co-breeding, co-creation, co-development, etc. have emerged more prominently in the present day context. Learning of different kinds has been evolved - interactive, experiential and alternative. Now concern is not only with capacity building but with mind sets, perceptions, priorities and realities.

In the past, ICAR led in responding to the contemporary challenges and other issues of Indian agriculture whether it was Green Revolution (complimented with National Demonstration,

1964), upliftment of small and marginal farmers (complimented with Lab to Land Programme, 1979), watershed development, soil improvement, crop protection, focus on weaker section (complimented with Operational Research Project, 1974), technology assessment and refinement (complimented with IVLP, 1995), etc., its response was timely and need based. Now, the initiatives of NAIP have extended the efforts towards improving rural livelihood of farmers living in less favoured, marginal or more complex environment. Therefore to ensure greater participation of farmers in research and development, it was thought appropriate to have Farmer First Project. For this purpose the committee was constituted.

There is a growing perception that the emerging demand of the farmers about the recent technological and institutional needs, are not adequately addressed. Also, many a times, research system is not getting adequate feedback to plan and conduct demand driven research consequently, a gap exists in the quality of research output required at the farm level and that being developed. It is also being perceived that the research system should play a pro-active role in reaching to the farmers for getting first hand information, farmers' perceptions, feedback on generated technologies and develop new, more appropriate processes, methodologies and technologies for diverse farm environments.

3.2 Farmer FIRST : Enriching Knowledge - Integrating Technology

The proposed project - 'Farmer FIRST' is an ICAR initiative to move beyond the production and productivity, to privilege the small holder agriculture and complex, diverse and risk prone realities of majority of the farmers through enhancing farmers-scientists contact. There are concepts and domains that are new in emphasis like resource management, climate resilient agriculture, production management including storage, market chains, value chains, innovation systems, information system, etc. The Farmer FIRST as a concept of ICAR is developed as farmer in a centric role for research problem identification, prioritization and conduct of experiments and its management in farmers' conditions. The focus is on farmer's farm, innovations, resources, science and technology (FIRST). Two terms '*enriching knowledge*' and '*integrating technology*' qualify the meaning of Farmer FIRST in Indian context. Enriching knowledge

signifies the need for the research system as well as farmers to learn from each other in context to existing farm environment, perception of each other and interactions with the sub-systems established around. Technology integration is looked from the perspective that the scientific outputs coming out from the research institutions, many times do not fit as such in the farmers' conditions and thus, certain alterations and adaptations are required at field level for their acceptance, adoption and success.

3.3 Past Experimentations on Technology Application

In the past, ICAR has made several attempts to pass on the technologies to the farmers to raise the production and productivity of different commodities and enterprises. Some of the major initiatives are briefly presented as under:

3.3.1 National Demonstrations (ND) on major food crops was launched in 1964. The rationale behind the scheme was that unless the scientists could demonstrate what they advocated, their advice might not be heeded by the farmers. The conceptual framework of national demonstrations was conceived and initiated by Dr. M.S. Swaminathan, it was nationwide project with a uniform design and pattern. The national demonstrations were intended to show the genetic production potentiality of new technologies and to influence both the farmers and the extension agencies. The specific objectives of National Demonstrations were as follows:

1. To demonstrate convincingly to the farmers and extension personnel the genetic production potentialities of major crops per unit area of land and per unit time, and encourage them to adopt and popularize these technologies for accelerating production.
2. To fully exploit these demonstrations for the purpose of training farmers and field extension functionaries in improved cultivation practices.
3. To provide the research workers an opportunity to get first hand knowledge of the problems being faced by the farmers in adopting high yielding varieties and recommended package of practices.

4. To determine the income and employment generation potentialities of the crops/subjects under demonstration, and educate the farmers and extension agents about them.
5. To influence the extension systems of the State Departments of Agriculture, voluntary organizations, etc. in the country by demonstrating the yield gaps and pointing out operational constraints.

To achieve the best results, the most enthusiastic and cooperative farmers were selected, the best technologies and techniques used, and a team-approach followed involving scientists from relevant disciplines, including local extension agents. The organization of field days, field visits, and training for the farmers and field extension workers were considered important for rapid spread of technologies.

These demonstrations revealed beyond doubt, the wide gap which existed between what was possible by way of production and what was being realized. The cost of production per hectare was higher in national demonstrations owing to adoption of new agricultural technology. The return was also higher and economical as compared to general farming conditions. The national demonstration project once covered 100 districts, spread all over the country.

3.3.2 The *Operational Research Project (ORP)* initiated in 1974-75, aimed at disseminating the proven technologies in a subject matter/area among farmers on a watershed basis, covering the whole village or a cluster of villages, and concurrently studying constraints (technological, extension or administrative) as barriers to the rapid spread of improved technical know-how. The experience with the National Demonstration Project highlighted the issue that demonstration of a particular technology or a combination of technologies in an area on watershed basis would prove more effective in convincing farmers and provide them greater scope for identifying constraints, many of which were community-based.

The conceptual framework of ORP was that it was primarily devoted to demonstrating the impact of new technologies on a large scale by involving allied agencies and institutions to show the need for inter institutional and inter disciplinary approach.

The ORPs considered two kinds of problems: first, the common

agricultural problems affecting the farming community which required group or community action, e.g. plant protection and rodent control; and the second, total resources development of the watershed area. The specific objectives of ORP were as follows.

1. To test, adopt and demonstrate the new agricultural technology on farmers' fields in a whole village or in a cluster of few contiguous villages/watershed area.
2. To determine the profitability of the new technologies and their pace of spread among the farmers.
3. To identify the constraints both technological, as well as socio-economic which are barriers to rapid change.
4. To demonstrate group action as a method of popularizing the modern technologies at a faster rate.

The ORPs covered diverse topics like crop farming, mixed farming, integrated pest management, plantation, land reclamation, arid land management, fisheries, etc. The ORPs demonstrated latest agricultural technologies on the farmers' fields to influence the farmers as well as the State extension agencies. It also studied the socio-economic, technological, extension and administrative barriers which were coming in the way of rapid transfer of technologies and pointed out the same to the research and extension systems. This led wide scale adoption of new technologies at community level such as watershed, soil amelioration, plant protection practices.

3.3.3 The programme for transfer of viable technologies from laboratories to farmers' fields, popularly known as the '*Lab-to-Land Programme*', was launched in the country on 1 June 1979 as a part of the ICAR Golden Jubilee Celebration. Under this programme, 50,000 farming families comprising small and marginal farmers and landless agricultural labourers were adopted by the ICAR through its Research Institutes and Agricultural Universities for their economic upliftment. The programme being of special nature became an integral part of the extension activities of the concerned participating institutions. The programme had two major dimensions; (i) to study the family profile for evolving and executing an appropriate farm family plan and (ii) to provide both, technical and financial support for effecting a substantial change in the economic condition of the poorest sections of the rural community. The specific objectives of

the lab to land programme were :

1. Study and understand the background and resources of the selected farmers and landless agricultural labourers. To introduce low-cost relevant agricultural and allied technologies on their farms and homes for increasing their employment, production and income.
2. Assist the farmers to develop feasible farm plans keeping in view the availability of technologies, needs and resources of the farmers, and the resources which could be made available from external sources and agencies.
3. Guide and help the farmers in adopting improved technologies as per their farm plans, and demonstrate to them the economic viability of those technologies as well as methods of cultivation and farm management.
4. Organize training programmes and other extension activities, in relation to their adopted practices, and prepare them for active participation in agricultural development programmes of the State.
5. Make the farmers aware of the various opportunities and agencies which they could utilize to their economic advantage.
6. Develop functional relations and linkages with the scientists and institutions for future guidance, advisory services and help.
7. Utilize this project as a feedback mechanism for the agricultural scientists and extension functionaries.

The programme was highly successful in increasing production and income of the farmers. Its first phase continued up to May 1982 (three years). The second phase of this programme was started from June 1982 with 75,000 new farm families. This programme continued also up to May 1984 (two years). The third phase of the programme started from June 1984. It envisaged to select 50,000 small and marginal farm families and landless agricultural labourers with priority to weaker sections of the society. The programme aimed at assisting these selected farm families in developing and implementing individual farm plan for improving the entire farming system and there by generating more employment and income. The basic idea was to bring to scientists and the farmers in close contact and to introduce low-cost relevant technologies' which could help in

diversification of labour-use and creating supplementary sources of income in the fields of agriculture, animal husbandry, sericulture, apiculture, fisheries, rural crafts, etc. Assistance to the extent of Rs. 500 per family per year for critical inputs was made available to implement the programme.

3.3.4 The *Institute Village Linkage Programme (IVLP)* was started by ICAR in 1995 with special emphasis on generating appropriate technologies by refining and assessing innovations generated by scientists in different farm production systems viz. commercial, green revolution and complex, diverse and risk prone. It was implemented through ICAR institutions, SAUs, ZRSs and KVKs following basket approach in cluster of village. The specific objectives of technology assessment and refinement programme were:

1. To introduce technological interventions with emphasis on stability and sustainability along with productivity of small-farm production systems.
2. To introduce and integrate the appropriate technologies to sustain technological interventions and their integration to maintain productivity and profitability taking environmental issues into consideration in a comparatively well defined farm production systems.
3. To introduce and integrate the appropriate technologies to increase the agricultural productivity with marketable surplus in commercial on and off farm production systems.
4. To facilitate adoption of appropriate post-harvest technologies for conservation and on-farm value addition of agricultural products, by-products and wastes for greater economic dividend and national priorities.
5. To monitor socio-economic impact of the technological intervention for different farm production systems.
6. To identify extrapolation domains for new technology/ technology modules based on environmental characterization at meso and mega levels.

3.3.5 The *National Agricultural Innovation Project (NAIP)* was started in the year 2006. The overall objective of NAIP is to facilitate the accelerated and sustainable transformation of Indian agriculture

in support of poverty alleviation and income generation through collaborative development and application of agricultural innovations by the public organizations in partnership with farmers groups, the private sector and other stakeholders. The specific objectives are:

1. To build the critical capacity of the ICAR as a catalyzing agent for management of change of the Indian NARS.
2. To promote production to consumption systems research in priority areas/themes to enhance productivity, nutrition, profitability, income and employment
3. To improve livelihood security of rural people living in selected disadvantaged regions through innovation systems led by technology and encompassing the wider process of social and economic change covering all stakeholders.
4. To build capacity and undertake basic and strategic research in strategic areas to meet technology development challenges in the immediate and predictable future.

Component on livelihood security of the rural people in disadvantaged regions was built to bring benefits of technology innovations to large number of small, marginal and tribal farmers for economic and technological empowerment.

3.3.6 Summary of Earlier Efforts

Name of the Project	Year	Objective	Approach
National Demonstration	1964	To demonstrate genetic production potentialities of major crops.	<ul style="list-style-type: none"> • Demonstration by Team of Scientist • Crop focused • Uniform design and pattern
ORP	1974	Disseminating the proven-technology in a discipline/area among farmers and concurrently study of constraints (technological extension or administrative)	<ul style="list-style-type: none"> • Whole village/cluster of villages • Group action • Problem/area focused

Name of the Project	Year	Objective	Approach
LLP	1979	To improve the economic condition of the small and marginal farmers and landless labourers by transfer of improved technology	<ul style="list-style-type: none"> • Feasible farm plans • Family centered • Emphasis on all aspects of agriculture • Linkages and feedback • Phased programme
IVLP	1995	Technology Assessment and Refinement	<ul style="list-style-type: none"> • Basket approach • Technology focused • Involvement of all the households including landless • Participatory approach • Village based • Multi-disciplinary team
NAIP contd.	2006	Facilitate accelerated and sustainable transformation of Indian agriculture	<ul style="list-style-type: none"> • Collaborative development • Application of agricultural innovations • Partnership • Tribal and disadvantaged areas

3.3.7 Global Experience

Robert Chambers (1987) worked on **Farmer First** with insights of three broad categories of types of agriculture (Industrial, Green Revolution and the CDR or complex, diverse and risk-prone). It was realized that the pipeline approaches and methods of transfer of technology (TOT) for the uniform and controlled conditions of industrial and green revolution agriculture did not fit CDR conditions; farmers' practices were seen as adaptive performance; the adoption by farmers as validation of a technology; the comparative advantage of farmers over scientists in innovating for complex systems; and many others.

Five years later, in 1992, Ian Scoones and John Thompson came

with *Beyond Farmer First* concept. This stressed perspectives that broadened and complemented Farmer First, the pluralism of different knowledges; the recognition of knowledge not as a stock but a process; seeing farmers, extensionists, scientists and others as social actors; recognizing social dimensions and the significance of relations; and elements of a new professionalism in agricultural science.

In *Farmer First Revisited* (2007), it was seen how far the idea had been perceived, how many more domains than just farmer participation were relevant, and how rich the range of innovations had been. In Farmer First, the focus was on the complexity and diversity of farming systems and the creativity of farmers. In *Farmer First Revisited* it was the complexity and diversity of domains of action and intervention and of relationships, and the co-creativity of many different actors.

3.3.8 The Need: The past efforts brought lot of successes in terms of raising production and productivity and addressing issues of the farmers and the technology was considered as a most vital factor in the production system and farmer as a recipient of the technology outputs. The knowledge and innovations of the farmers were not valued much and their presence was relegated at most as a participant but not as a partner of the experimentations and the wisdom available with the farmers was also not channelized so much to derive suitable options for different production systems. The participation of multiple stakeholders was also not taken up in perspective for technology development, integration and adoption. Now the situation has changed drastically in terms of increased number of small holders, growing proposition of women led agriculture, need for higher return per unit area and addressing emerging socio-economic environment, etc. This necessitates new approach for project development involving innovation and technology development with the strong partnership of the farmers for developing location specific, demand driven and farmer friendly technological options.

3.4 Applying Farmer FIRST

Farmers tend to face problems related to production and natural resource management but they might not have found out solutions to overcome them. In such situations, Farmer FIRST is an opportunity for the researchers, extension personnel and farmers to work together

and find appropriate ways through assessing different solutions. During the production process, farmers often evolve new ideas to improve their cultivation and natural resource management activities. This creates a space for researchers, extensionists and farmers to design and organize new experiments.

Farmer FIRST can be applied not only at household level but also at village and community level as community experimentation. Usually, the experiments are managed at the individual farmer's level who are involved in the project or who are selected by the village as the representatives to conduct experiments. In addition, there are some cases where experiments focus to solve problems of the whole village.

Farmer FIRST is a concept in which the farmers participate in the research process with scientists. Research questions are found out together with selected farmers or the whole village and villagers' participation in monitoring experiments with scientists. The aim is to find out new ways of doing and bringing in synergy of the stakeholders. The experiments need to be adapted to specific conditions of a farming system and to have the participation of farmers as well as scientists. Especially they must acknowledge local knowledge as a vital element for the development of useful innovations. The role of extensionists is to ensure implementation.

Farmers FIRST will create linkages between farmers-researchers and extensionists to support farmers to conduct appropriate experiments selected by them. It will help researchers and extensionists understand and know real needs of villages. In this process, priority does not come from researchers or extensionists but from the end users of results of research and technology development.

3.5 Roles of stakeholders

Farmers

- Actively manage, implement and monitor experiments / trials
- Use labour and available resources to conduct experiments/ trials
- Closely link with extension and research in the process
- Share their experiences with other farmers.

Researchers /teachers

- Researchers have responsibilities to implement research and technology development in reality
- Study local knowledge, analyze issues of farmers together with them, identify and prioritize problems
- Participate in the whole process together with farmers and extensionists, provide technology information, scientific knowledge to support the implementation
- Involve farmers in monitoring, documentation and evaluation of experiments

Extensionists

- Carry out extension activities such as organizing farmer to farmer experience exchange, developing extension materials based on experiment results and disseminating results.

3.6 Benefits to farmers and villagers

- Farmers get an opportunity to solve their problems or try out new idea that they themselves could not do without the support of the researchers and extensionists.
- Improve experimenting and technology development capacity.
- Learn and share production experience with outside actors and other farmers
- Better access to extension programmes, services and information about technologies, markets, prices, etc.
- **Extensionists:**
- Learn new extension tools and methods which satisfy farmers' needs.
- Improve their capacity through close monitoring of experiments, a learning by doing process
- Better access to scientific and local knowledge
- Get support of the farmers for better spread of the results through "farmer-to-farmer" process
- **Researchers and teachers:**
- Learn local knowledge through working with the farmers and extensionists

- Implement research that suit farmers' conditions.
- Improve research methods and facilitate field based learning. Improve knowledge and skills in participatory research approaches.

3.7 Aims and Objectives

'Farmer FIRST' aims at enhancing farmers-scientists interface for technology development and application. It will be achieved with focus on innovations, technology, feedback, multiple stakeholder's participation, multiple realities, multi method approaches, vulnerability and livelihood interventions.

Objectives

The specific objectives are:

1. To enhance farmer-scientist interface, enrich knowledge and facilitate continued feedback;
2. To identify and integrate economically viable and socially compatible technological options as adoptable models for different agro-ecological situations;
3. To develop modules for farm women to address drudgery reduction, income enhancement and livelihood security;
4. To study performance of technologies and perception of the farmers about agriculture as a profession in the rural settings;
5. To build network of linkages of organizations around the farm households for improving access to information, technology, input and market.
6. To institutionalize Farmer FIRST process.

3.8 Components

The project is conceptualized to deal with focus on:

- i. Enhancing Farmer -Scientist Interface

Enabling involvement of researchers for continuous interaction with farm conditions, problem orientation, exchange of knowledge between farmers and other stakeholders, prioritization of problems and setting up of research agenda

ii. Technology Assemblage, Application and Feedback

Integrating components of technology for application in different agro-ecosystems with focus on innovations and feedback

iii. Partnership and Institution Building

Building partnerships involving different stakeholders, development of rural based institutions, agro-ecosystem and stakeholders analysis and impact studies

iv. Content Mobilization

Using the platform of the project having institutions as partners to develop specific contents for e-enabled knowledge sharing

3.8.1 Enhancing Farmer – Scientist Interface

Many developments are taking place in Indian agriculture including modernization of technology institutions, emergence of new science like biotechnology, precision farming, remote sensing, recognition of role of public-private partnership in agricultural growth, etc. Despite all such efforts of building infrastructure networks and environment for agricultural development, farmer-scientist strong interface remains the key for demand driven appropriate technology development and application based on ground realities, existing agro-ecological environment, farmer's needs, market demand and capabilities of the system.

Eighty per cent of poor live in rural areas and access of information, knowledge and skill for their livelihood is very vital. There are women who contribute a lot but their exposure to technology and related institutions is very limited. The efforts to bring farmers and scientists on one platform will provide opportunity of knowledge sharing, confidence building and deriving synergy in approach and content for all round development.

- This component will create a strong farmers-scientist bond for continuous exchange of idea, innovations, resources, feedback for development of appropriate technology and human resource development.
- Identification of farm innovators and grooming them as technology agents for farmer to farmer technology dissemination.

- Regular visits of project team and other scientists to project site for orientation of problems and ground realities.
- Multi stakeholders' participation in building strong farmers-scientists interaction.
- Regular interactions of farmers-scientists at institute and project site through trainings, visits, workshops, interfaces, extension activities, etc.
- Identifying farm innovations and working out its applicability on wider scale.

3.8.2 Technology Assemblage, Application and Feedback

Technology is a strong vehicle of growth in agriculture sector. The increase in production especially of food grains, milk, fruits, vegetables, eggs and fisheries have been phenomenal. However, of late there are serious concerns that factor productivity is decelerating in many areas and there is realization that a new momentum needs to be provided for pushing agricultural growth and ensuring higher returns per unit of investment looking into the increase in biotic and abiotic stresses, changing food habits, climatic change and vulnerability and attraction of younger generation towards urban centres. The institutions / universities are working on different commodities under varying resource conditions to prepare technology capsules for macro situations. However, it is realized that technology capsules as such are not appropriately adaptable in micro farm household situations. A farmer with small holdings or landless, needs a definite plan of action to be implemented by him to sustain his family with flow of income on regular basis to meet out daily requirement. Often, the technology aspect is taken care of but the aspects like requisite infrastructure, economic and market interventions are ignored which ultimately cause failure of even a potential technology. This component will provide an opportunity to farmers and researchers to work together and make assemblage of a technology module for its assessment and application and generate feedback.

- i) **Crop based modules:** This module will focus on intensification and diversification of existing systems with introduction of new varieties and technologies to substantially enhance income. On site input management like seed production by farmers through

training, timely supply of quality seeds and resource management may be major activities.

- ii) **Horticulture based module:** The focus in case of horticulture may be given on seed production and nursery management, vegetable, fruit production, floriculture, post harvest management, poly house technology and adoption of new technologies.
- iii) **Livestock based module:** This segment will focus on raising the production and productivity of existing livestock, introduction of new breeds, animal health management , development of viable milk production units, poultry and fisheries. The livestock related different modules are to be developed as per the micro farming situations and socio-economic status of the farmers.
- iv) **Enterprise based module:** This segment will cover various income generating activities like seed and other inputs production, bee keeping, mushroom production, vermi compost production, handicraft, product processing, marketing through federating farmer groups ,etc. The farmers, youth, landless and farm women may be important target groups.
- v) **NRM based module:** This module will have the insight to work upon natural resource management, climate resilient agriculture, use of resource conservation technologies, water harvesting and micro irrigation, micro-organisms, land races and bio diversity, etc.
- vi) **Integrated Farming Systems (IFS) module:** For different categories of land holders based on resource availability, socio-economic conditions, risk bearing capacity, market availability, etc.

3.8.3 Partnership and Institution Building

There are multiple players (public sector, private sector, NGOs, civil society organizations, development departments, etc.) working for agricultural development particularly in case of management of inputs and marketing of produce and they provide vital link in pursuing the technology absorption in the farm situation. Therefore, an attempt of technology development and dissemination must have close linkage with input and market support system. The project

envisages a model of partnership in project area of different actors on multiple perspectives so as to harness the potential of each of them in supporting the farmers. The project will also aim for building farmer led on site input management groups, commodity groups, marketing groups, NRM groups, etc. to create an environment of house hold support in and around the project area.

The project will make an attempt to create a database at the national level through agro-eco system analysis, exploration of level of technology gap, constraints analysis, perception and attitude of farmers, youth and farm women about various segment of agriculture. Impact studies of successful modules will also be integral part of database creation. This kind of database will definitely help NARS and other stakeholders in developing their research and development programmes. The major activities will be:

- i) Creation of models of partnerships
- ii) Institution building for bringing professionalism, leadership, marketing ability, organizing capability among farmers, database creation on perception, attitude and agricultural scenario.

3.8.4 Content Mobilization

Launching of project is going to involve a large number of research institutions and therefore, it is intended to utilize this opportunity to build a pool of content available with partnering institutions. As of now, such content is scattered. Static content and dynamic content generated during the project period will help the farmers and farm women across the country. The knowledge capsules and technology modules generated as a project outcome will also benefit in content mobilization.

The major activities will be:

- i) Identification and pooling of available transferrable technologies available with different institutions.
- ii) Project outcome to be utilized as part of content.
- iii) Preparation of knowledge models as network representation of agricultural knowledge.
- iv) Content management platform enabling off and online access.

4 PROJECT IMPLEMENTATION, MONITORING AND EVALUATION

4.1 Operational Area and Participating Institutions

ICAR Institutes (97), SAUs (22) and CAU (1) will take part in implementation of the project at field level. One institute will adopt about 1000 farm families spread over in nearby 2-4 villages. The farmers will be the major target groups with emphasis on small and marginal farmers and farm women. The four ICAR institutes like NAARM, NCAP, IASRI and DKMA will provide support to the project in development of processes and methodologies, content development, database creation and regular assessment and impact evaluation.

4.2 Project Team

The Head of institution will lead the project with support of a Nodal Officer nominated for the purpose. A project team headed by a Principal Investigator and 4-5 related associated scientists as Co-PIs as per requirement of the project will be nominated by the institute. PIs and Co-PIs will be from the project implementing institution. However, one or two scientists may be opted from other institutions as collaborating scientists or Co-PIs by the specific institutions to support the other requirements of the farmers. A Principal Scientist/Senior Scientist may act as PI. PI will be responsible for project planning and implementation. The composition of 4-5 scientists may include one social scientist. It will be the responsibility of the Head of the institute to nominate nodal officer and constitute the project team. The project team will launch the programme in selected villages on different thematic areas and conduct interface programmes at project site, institute or other places. The project team will involve each scientist of institute with the participation of the scientists in seasonal interfaces, project planning, diagnostic and monitoring visits.

The scientists of the institute/university other than the project team, may form sub- teams of 4-5 scientists and develop sub-projects as part of the main project, plan and implement the activity in the village involving small group of farmers. Thus, there may be number

of sub- teams in the institute/university to work on different technology modules.

4.3 Farmer FIRST Process

- 4.3.1** *Preparation phase:* The Project team/sub teams (including researchers, extensionists and farmers) will identify villages and conduct baseline survey of selected villages, analyze issues and opportunities in the selected villages and identify priority areas for undertaking activities in partnership with farmers. The group will also prepare benchmark report and understand about organizational aspect and develop rapport in the village.
- 4.3.2** *Initiation phase:* This is an important phase of the Farmer FIRST process in which problems are identified, appraised and selected for experimentation. The group in collaboration with other farmer groups, design individual and community experiments. Farmer Interest Groups will be formed to start designing their expected experiments. There are 5 steps in this stage: 1) Identification of problems, priorities & technology options; 2) clarification on problems & priorities; 3) selecting prioritized problems for experiments; 4) selecting individual farmers or community/commodity groups to conduct the experiments; and 5) designing the experiments with specific reasons, indicators and technologies.
- 4.3.3** *Implementation phase:* The project team will develop action plans, visit schedules and collaboratively implement the programme. The farmers will work as team member with extensionists and researchers during the experimentation process.
- 4.3.4** *Monitoring and documentation phase:* In terms of time, this is implemented at the same time with the implementation stage but because of its importance it is mentioned as a separate component. In this phase, stakeholders will be involved in monitoring and documentation of all emerged issues and lessons learnt. The indicators identified in the experiment will be recorded by farmers and researchers. Comments of outsiders and other farmers will also be recorded. Documents, regular reports will be produced and provided to related interested people in and outside the village. One

key step in this stage is participatory monitoring and documentation of the process.

- 4.3.5** *Finalization phase:* It is actually an event rather than a stage, but it plays an important role in synthesising experiences. The objective of this phase is to evaluate and identify whether the intervention is successful or not? The farmers who conduct the experiment prepare and explain their experiences and results to other stakeholders and farmers. This stage includes 1) organization of participatory evaluation in the field, and 2) documentation, report writing.
- 4.3.6** *Dissemination phase:* Experiences, innovations and other outputs should be disseminated. “Farmer to farmer” extension will be useful for dissemination and experience sharing with other farmers and villagers. This stage includes two main steps: 1) develop extension materials and 2) organize different extension activities to spread out the results. The network of centres can also be used for dissemination of proven technologies.

4.4 Implementation matrix of Farmer FIRST process

Matrix: I Situation analysis, problem identification, and preparation of Farmer FIRST project activities

Objectives	Implementation process	Methods and tools	Duration	Participants
A. Situation Analysis				
<ul style="list-style-type: none"> Stakeholders have common understanding on village conditions; Identify opportunities and problems; Sharing the project and its process with the farmers. Clarify benefits and responsibilities of different partners. The researchers create reliable relationship with farmers. 	<ul style="list-style-type: none"> Organize rural assessment Selection of village and farmers based on village representing the agro-ecological situations and socio-economic priorities of the region and its approachability The farmers identified should represent different socio-economic group, communities/commodities. Farm women and landless should also be included 	RRA, PRA, problems tree, Benchmark survey, Meeting and discussion with farmers and local authority	4- 6 days	Key farmers, extensionists researchers and other stakeholders
B. Selection of problem priorities				
<ul style="list-style-type: none"> Presenting general information about Farmer FIRST to villagers. The participation of villagers is agreed upon. The issues, problems and priorities are agreed upon. The programme for Farmer FIRST in villages is agreed. Core farmers involved in Farmer FIRST initiation are identified (sex, age, commodity groups, resource groups, associations etc). 	<ul style="list-style-type: none"> Introduction of Farmers First project to farmers. Clarifying stakeholders' responsibilities, benefits Problems are identified Making the plan Selecting farmers for initiation. 	Village meeting	3-4 days	All villagers and village leaders; extensionists, researchers and other stakeholders

Matrix 2: Selection of Technology Assessment and Application modules

Objectives Expected results	Implementation process	Methods/ Tools	Duration	Participants
<ul style="list-style-type: none"> • Modules are presented to all villagers and are screened carefully. 	<ul style="list-style-type: none"> • Screening technology modules • Selection of modules 	<ul style="list-style-type: none"> • Group discussion with core farmers 	1 day	All villagers, Extensionists, researchers and village leaders
Formation of Interest Groups/ Commodity Groups and selection of households for experiments				
<ul style="list-style-type: none"> • To form small commodity specific Interest Groups of farmers, farm women, landless, for example goat growers, basmati rice growers group, marketing group, apple growers, dairy group, women group, honey producers group, etc • Develop criteria for selecting households 	<ul style="list-style-type: none"> • Criteria for selecting households are agreed by villagers 	<ul style="list-style-type: none"> • Brainstorming to develop criteria for selecting households • Discussing in the meeting • Farmers association with different commodity groups to be identified 	<ul style="list-style-type: none"> • 1/2 day 	<ul style="list-style-type: none"> • Villagers, extensionists and researchers

Matix 3: Action plan development and implementation

Objectives	Procedure	Methods/Tools	Duration	Participants
A. Action plan				
<ul style="list-style-type: none"> To develop specific action plan for each experiment, that is suitable to local situation involving all the stakeholders. The action plan clearly defines responsibilities of each actor, time, necessary inputs, and contributions of farmers. 	<ul style="list-style-type: none"> Planning development with the participation of stakeholders Sharing action plan with other relevant stakeholders 	<ul style="list-style-type: none"> Facilitate the commodity/ interest group to develop the action plan. Use of Planning matrix tool 	1 day	Commodity/ Interest groups, extensionists and researchers
B. Action Plan Implementation				
<ul style="list-style-type: none"> The researchers and extensionists help the farmers to implement the experiment following the designed plan. 	<ul style="list-style-type: none"> Making the schedule for visits. Together implementing the experiment and work in the field 	Use of technology modules	Number of visits and duration according to the action plan	Farmers, extensionists and researchers

Matrix.4: Monitoring/experiment evaluation, and report writing

Objectives	Procedure	Methods/Tools	Duration	Involved persons
A. Monitoring, recording and documentation				
<ul style="list-style-type: none"> Participatory monitoring and evaluation is organized and carried out during the experiment process. Results and experiences are recorded, documented and provided to related organizations. 	<ul style="list-style-type: none"> Organize participatory monitoring and evaluation Document experiment procedure/ process 	<ul style="list-style-type: none"> Monitoring diary of farmers. Experience exchanging between farmers. Document the process in different types: reports, documents, farmer diaries, pictures, video tapes. 	During experiment implementation	Farmers, researchers, extensionists, other farmers and interested stakeholders

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Objectives	Procedure	Methods/Tools	Duration	Involved persons
B. Experiment evaluation				
<ul style="list-style-type: none"> Experiments are evaluated with the participation of relevant stakeholders and farmers Results are analyzed and consolidated to draw the experience. 	<ul style="list-style-type: none"> Preparing for the evaluation by the farmers Evaluation at the experiment site 	<ul style="list-style-type: none"> Data analysis Participatory evaluation at experiment site Using criteria to evaluate the experiment 	1 day	<ul style="list-style-type: none"> Farmers in the village and in other villages Households involved in the experiment. Extensionists, researchers and other relevant stakeholders
C. Report writing				
<ul style="list-style-type: none"> A final report of the experiment is completed, in which the experiment process and lessons learnt are presented. The report meets the information demand of relevant actors The report is distributed to related organizations and farmers 	<ul style="list-style-type: none"> Make a report outline for each specific target user. Write the report 	<ul style="list-style-type: none"> Developing the outline with the participation of farmers Documentation 	1 week	<ul style="list-style-type: none"> Researchers, extensionists and farmers

Matrix 5: Dissemination of successful project outputs

Objectives	Procedure	Methods /Tools	Duration	Participants
<ul style="list-style-type: none"> New technology developed from the experiment are consolidated and made available for other farmers. Diverse approaches for dissemination are organized and facilitated by the farmers and extension system. 	<ul style="list-style-type: none"> Organize field experience sharing Cross-visit activity Support other farmers to apply the experiment results. 	<ul style="list-style-type: none"> Farmer to farmer Mass media system Cross-visit Meeting in the field Development of extension material Farmer to farmer exchange Project site meetings and interaction Distribution of literature 	Project Period	<ul style="list-style-type: none"> Farmers and Extensionists facilitate the dissemination process Researcher take lead in consolidation of learnings with the help of farmers and extensionists

Matrix 6: Criteria of a good Farmer FIRST Project

Stages	Steps	Criteria of a good Farmer FIRST project
Preparation	1. Situation analysis	<ul style="list-style-type: none"> The researchers, farmers and extensionists have a common understanding about the situation of the village. The researchers and extensionists create a trustworthy relation with the village
	2. Project orientation	<ul style="list-style-type: none"> The villagers are provided with information about Farmer FIRST and it is agreed by the relevant actors.
Planning	3. Prostem Prioritization	<ul style="list-style-type: none"> Researchers spend sufficient time (up to 20%) in the village and walk with different farmer groups to the field and forest for identifying problems and priorities Innovativeness should be the Key Priorities are developed with the farmers in the field. The ideas are presented clearly to all villagers by the key farmers. Risks and benefits of the experiments are analyzed. The ideas experimented are ranked and selected by villagers.
	4. Selection of households to conduct the experiments	<ul style="list-style-type: none"> Criteria for household selection are defined by the villagers. Households voluntarily participate in the experiment implementation and are selected by the villagers.
	5. Development of field experimentation	<ul style="list-style-type: none"> The design of the experiment is based on local and scientific knowledge.
	6. Development of database	<ul style="list-style-type: none"> The trials include sufficient number of criteria. The trials are developed with interested groups. Primary database on agriculture, acceptability of technologies, farmers perception, problems & priorities are developed.
Implementation of experiments	7. Development of action plan	<ul style="list-style-type: none"> The action plan is suitable with local and farmers' conditions. The action plan identifies clearly responsibilities of relevant actors, time, necessary inputs and contributions of farmers.

Stages	Steps	Criteria of a good Farmer FIRST project
	8. Implementation of project activities	<ul style="list-style-type: none"> • The researchers and extensionists are present when the farmers start the experiment and visit the field regularly according to the action plan. • The researchers and extensionists help farmers to solve problems in techniques and organization which are raised during the experiment process.
	9. Extrapolation	The network of institutions and project centres are utilized for content mobilization, exchange of knowledge and outputs for scaling up the results.

4.5 Major milestones

- Institutes to work with 1000 farm-families at one location involving 2-4 villages.
- Engaging 20% time of scientists for interface and project work.
- The project team may undertake number of visits as and when required. However, other scientists of the Institute to undertake required number of visits of the project site in a year and get involved in different project activities related to problem identification, prioritization, technology assessment, refinement, technology development, input production and management and impact assessment.
- Participation of project team and institute scientists at institute, village, district and state level interfaces with farmers and other stakeholders.
- Directory of prioritized problems and development of technology modules with farmers participation.
- Awareness and capacity building of farmers and other stakeholders in important areas concerning agriculture and allied sectors.
- Production of farm level technology inputs.
- Socio-economic development of farm-households.
- Development of database, information system and rural based institutions for technology, input, market and product management.

- Creation of network for germplasm collection and characterization.
- Development of strong linkage of NARS vis-à-vis farmers, development departments and other agencies.

4.6 Human Resource Development

At the national level a group of experts will be identified and oriented in project implementation strategy and related processes and methodologies. It will be responsibility of trained experts to orient scientists of all the participating centres in different batches in methodology of project implementation; stakeholder, vulnerability and livelihood analysis; impact evaluation; building data base and developing case studies, monitoring and reporting, etc.

The project centres will also take up various HRD programmes on knowledge sharing, skill development, farm innovation and innovators led technology up scaling for the participating farmers and other stakeholders before start of crop seasons.

4.7 National Advisory Panel

There will be a National Advisory Panel under the Chairmanship of Secretary, DARE and Director General, ICAR for reviewing the Progress of the project on half yearly basis and providing direction to PIU and ZPIUs. The panel will have members like Secretary ICAR; Financial Advisor, ICAR; Deputy Director General; Asstt. Director General; Zonal Project Director; 2 experts and 2 farmers. One member may be nominated to act as Member Secretary. The panel will conduct periodical review and provide directives for proper implementation of project. The panel will be empowered to take decisions for improvement, modification, continuance, or closure of the project.

4.8 Project Implementation Unit (PIU)

A PIU headed by DDG (Agri. Extn.) will be located at Division of Agricultural Extension, ICAR, New Delhi which will approve and monitor the projects. PIU will act for project finalization, implementation and monitoring. The PIU will meet on quarterly basis to review the project and accord sanctions to the projects submitted through ZPIUs. The PIU will be supported by an Expert Advisory Group (EAG) with members (3 experts, 3 farmers, Director-GA and Extension, ADG and one scientist)

4.9 Zonal Project Implementation Unit (ZPIU)

ZPIU headed by Zonal Project Director will be supported by a scientific advisory group (SAG) consisting 2 experts; 2 farmers and 2 representatives of line departments. The terms of reference for this committee will be to screen the project and provide guidance for improvement of project. SAG will recommend the project. The group will also review the progress of the project twice in a year.

4.10 Institute Advisory Committee (IAC)

The head of the institute will chair this committee which will consist the representation of project team, heads of the department, 1-2 line department officials. The committee will meet twice in a year before crop season and provide guidance for project formulation, implementation, reporting, etc. PI may act as member secretary to this committee. Besides, there will be Project Implementation Cell (PIC).

4.11 Site Plan Implementation Group (SPIG)

Site Plan Implementation Group will operate at village level with 6 to 8 members from different villages and representing enterprises/ commodities and socio economic groups; project team to act as its member, 1 to 2 scientists from institute as member, 1 representative from panchayat, line department, farmers associations, etc. The group will meet thrice in a year to identify the problems, priorities and suggest for project formulation and implementation.

4.12 Priority interventions by participating institutions

ICAR Institutes (multi-commodity focused)	Directorates/NRCs	National Bureaus	SAUs/CAU
<ul style="list-style-type: none"> ▪ Research problem identification and prioritization 	<ul style="list-style-type: none"> ▪ Research problem identification and prioritization 	<ul style="list-style-type: none"> ▪ Create public awareness 	<ul style="list-style-type: none"> ▪ Research problem identification and prioritization
<ul style="list-style-type: none"> ▪ Technology assessment and refinement 	<ul style="list-style-type: none"> ▪ Collaborating with one/more SAUs/ICAR Institutes for covering other aspects of technology requirement for the particular areas 	<ul style="list-style-type: none"> ▪ Human resource development 	<ul style="list-style-type: none"> ▪ Technology assessment and refinement

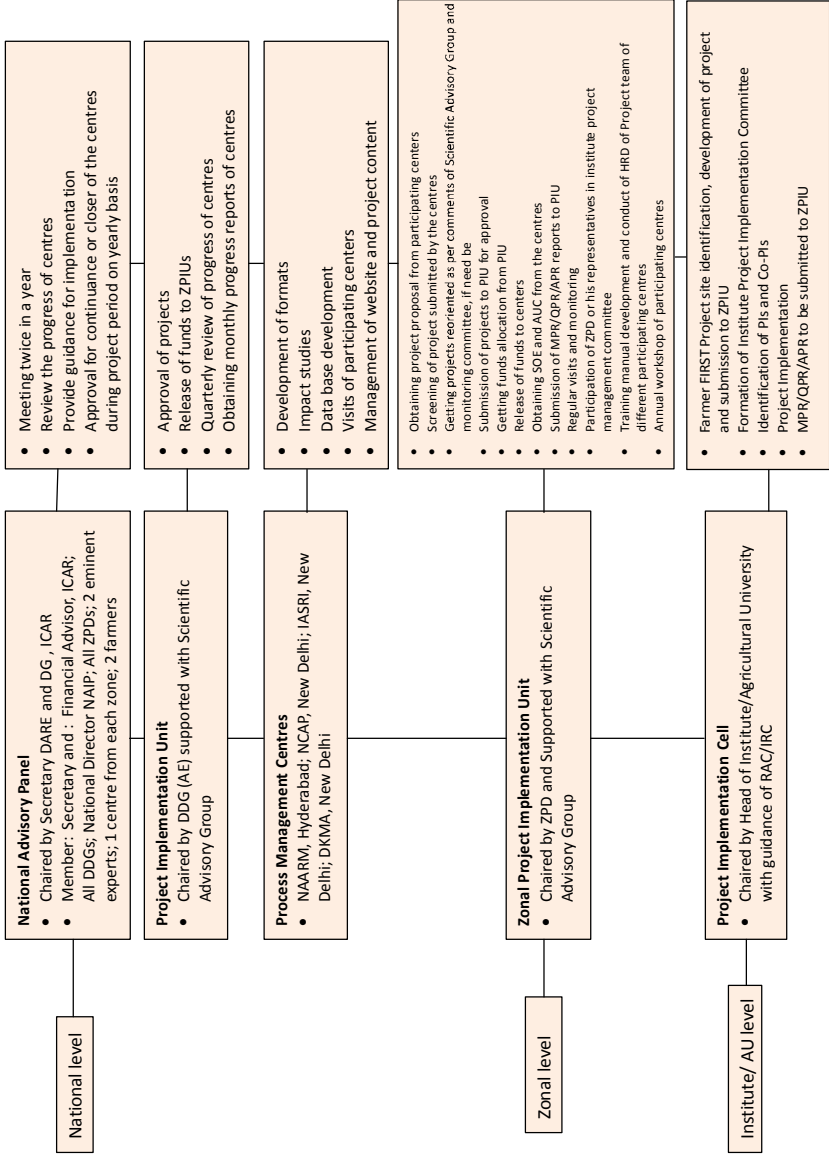
Project Implementation, Monitoring and Evaluation

ICAR Institutes (multi-commodity focused)	Directorates/NRCs	National Bureaus	SAUs/CAU
<ul style="list-style-type: none"> ▪ Development of household specific technology modules 	<ul style="list-style-type: none"> ▪ Technology assessment and refinement 	<ul style="list-style-type: none"> ▪ Collaborating with KVKs and regional research stations of ICAR/SAUs 	<ul style="list-style-type: none"> ▪ Development of household specific technology modules
<ul style="list-style-type: none"> ▪ Development of information system 	<ul style="list-style-type: none"> ▪ Development of household specific technology modules 	<ul style="list-style-type: none"> ▪ To identify, collect and characterize genetic resources in the area in collaboration with partners 	<ul style="list-style-type: none"> ▪ Development of information system
<ul style="list-style-type: none"> ▪ Creation of database 	<ul style="list-style-type: none"> ▪ Development of information system 	<ul style="list-style-type: none"> ▪ To develop information network 	<ul style="list-style-type: none"> ▪ Creation of database
<ul style="list-style-type: none"> ▪ Content mobilization 	<ul style="list-style-type: none"> ▪ Creation of database 	<ul style="list-style-type: none"> ▪ Recognize efforts of farmers and others in genetic resource preservation and development 	<ul style="list-style-type: none"> ▪ Content mobilization
<ul style="list-style-type: none"> ▪ Orientation of students to field situation 	<ul style="list-style-type: none"> ▪ Content mobilization 	<ul style="list-style-type: none"> ▪ Creating linkages with all the Farmer FIRST project teams for creating database 	<ul style="list-style-type: none"> ▪ Orientation of students to field situation
<ul style="list-style-type: none"> ▪ Field orientation of all the scientists as part of their job chart 	<ul style="list-style-type: none"> ▪ Field orientation of all the scientists as part of their job chart 	<ul style="list-style-type: none"> ▪ Identification of micro organisms ▪ Assessment and application 	<ul style="list-style-type: none"> ▪ Field orientation of all the scientists as part of their job chart
<ul style="list-style-type: none"> ▪ Involving its regional centers for larger farmer-scientist interface 	<ul style="list-style-type: none"> ▪ Involving its co-operating centers for larger farmer-scientist interface 	<ul style="list-style-type: none"> ▪ Provide micro organisms for experimentation 	<ul style="list-style-type: none"> ▪ Involving its regional centers for larger farmer-scientist interface
<ul style="list-style-type: none"> ▪ Collaborating with one/more SAUs/ICAR Institutes for covering other aspects of technology requirement for the particular areas 	<ul style="list-style-type: none"> ▪ Establishing linkages with line departments and private agencies in the project area 	<ul style="list-style-type: none"> ▪ Suitable reward and recognition 	<ul style="list-style-type: none"> ▪ Collaborating with one/more SAUs/ICAR Institutes for covering other aspects of technology requirement for the particular areas

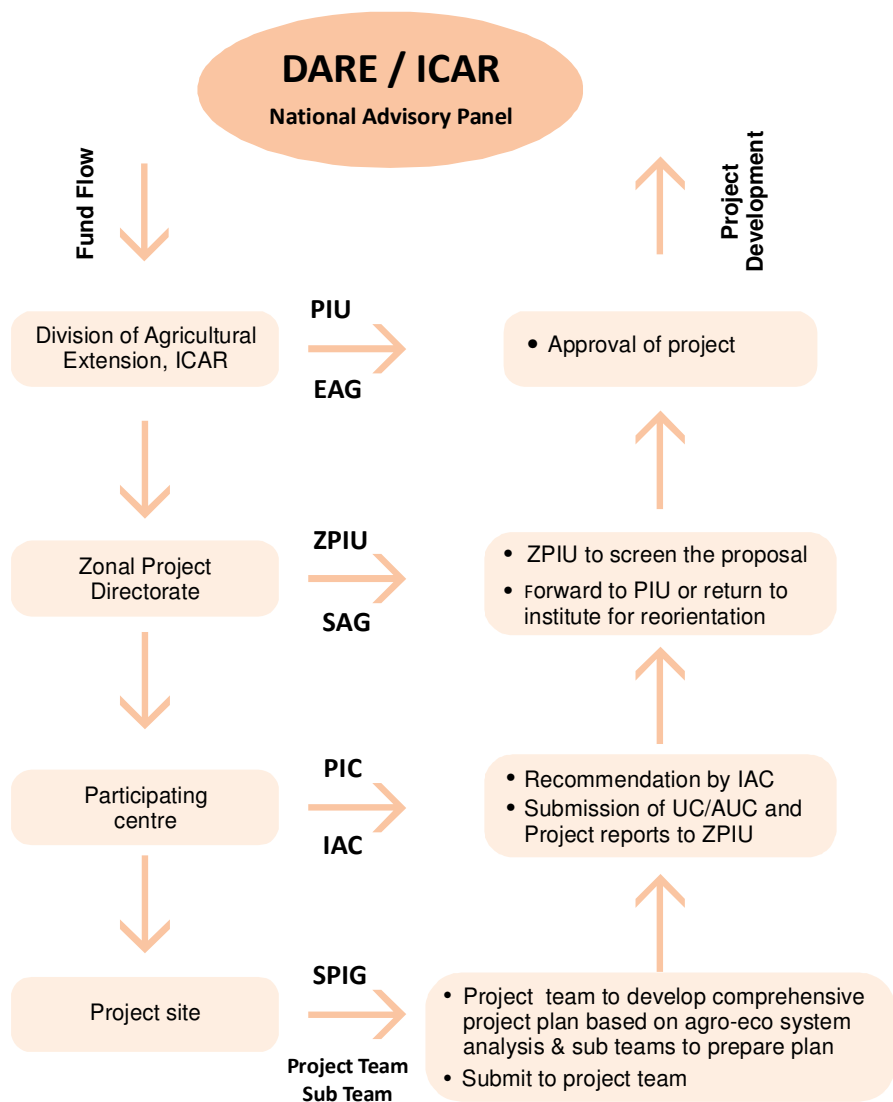
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ICAR Institutes (multi-commodity focused)	Directorates/NRCs	National Bureaus	SAUs/CAU
<ul style="list-style-type: none"> ▪ On-site input production and management 	<ul style="list-style-type: none"> ▪ On-site input production and management 		<ul style="list-style-type: none"> ▪ On-site input production and management
<ul style="list-style-type: none"> ▪ Conducting field studies on socio-economic perspective and impact evaluation 	<ul style="list-style-type: none"> ▪ Suitable reward and recognition 		<ul style="list-style-type: none"> ▪ Conducting field studies on socio-economic perspective and impact evaluation
<ul style="list-style-type: none"> ▪ Suitable reward and recognition 			<ul style="list-style-type: none"> ▪ Suitable reward and recognition

4.13 Organizational Chart of Farmer FIRST



4.14 Project Formulation, Sanctioning and Fund Flow Mechanism



ABBREVIATIONS

FIRST	Farm, Innovation, Resource, Science and Technology
NARS	National Agricultural Research System
IVLP	Institution-Village Linkage Programme
HRD	Human Resource Development
ASRB	Agricultural Scientist Recruitment Board
DARE	Department of Agricultural Research and Education
NAIP	National Agricultural Innovation Project
ND	National Demonstration
ORP	Operational Research Project
LLP	Lab to Land Programme
SAU	State Agricultural University
ZRS	Zonal Research Station
KVK	Krishi Vigyan Kendra
CDR	Complex, Diverse and Risk Prone
TOT	Transfer of Technology
NGO	Non Government Organisation
CAU	Central Agricultural University
NAARM	National Academy of Agricultural Research Management
NCAP	National Centre for Agricultural Economics and Policy Research
IASRI	Indian Agricultural Statistics Research Institute
DKMA	Directorate of Knowledge Management in Agriculture
PIU	Project Implementation Unit
ZPIU	Zonal Project Implementation Unit
EAG	Expert Advisory Group
SAG	Scientific Advisory Group
PIC	Project Implementation Cell
IAC	Institute Advisory Committee
SPIG	Site Plan Implementation Group

