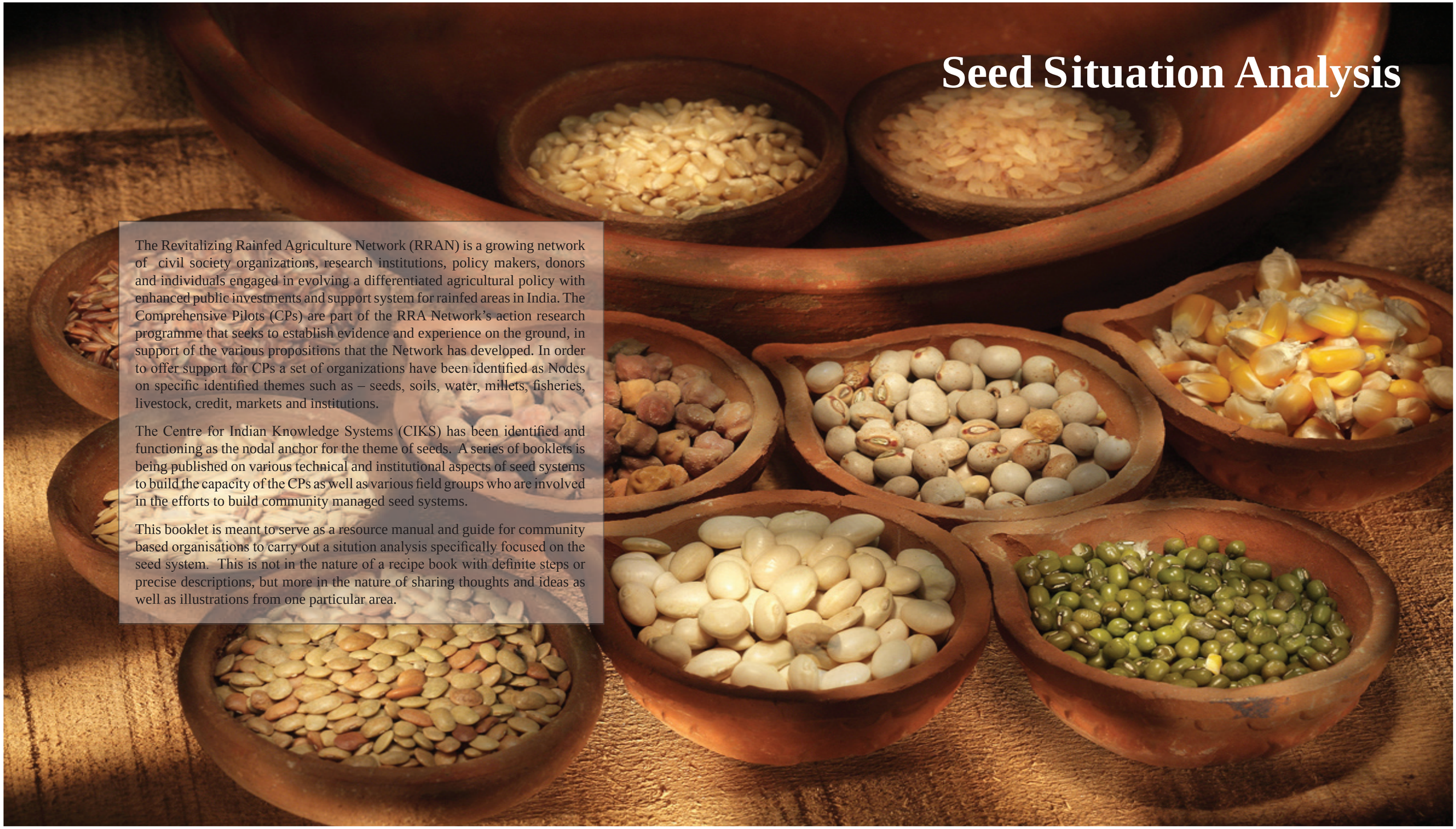
Seed Situation Analysis



The Revitalizing Rainfed Agriculture Network (RRAN) is a growing network of civil society organizations, research institutions, policy makers, donors and individuals engaged in evolving a differentiated agricultural policy with enhanced public investments and support system for rainfed areas in India. The Comprehensive Pilots (CPs) are part of the RRA Network's action research programme that seeks to establish evidence and experience on the ground, in support of the various propositions that the Network has developed. In order to offer support for CPs a set of organizations have been identified as Nodes on specific identified themes such as – seeds, soils, water, millets, fisheries, livestock, credit, markets and institutions.

The Centre for Indian Knowledge Systems (CIKS) has been identified and functioning as the nodal anchor for the theme of seeds. A series of booklets is being published on various technical and institutional aspects of seed systems to build the capacity of the CPs as well as various field groups who are involved in the efforts to build community managed seed systems.

This booklet is meant to serve as a resource manual and guide for community based organisations to carry out a sitution analysis specifically focused on the seed system. This is not in the nature of a recipe book with definite steps or precise descriptions, but more in the nature of sharing thoughts and ideas as well as illustrations from one particular area.

CIKS

Centre for Indian Knowledge Systems, Chennai
www.ciks.org

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Revitalising Rainfed Agriculture The RRA Network

Seed Situation Analysis

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Revitalising Rainfed Agriculture Network

December 2013

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Editorial Assistance	R. Abarna Thooyavathy
Design and Analysis of Baseline Data	T. Johnson and S. Balakrishnan
Editor	K. Vijayalakshmi
Publication	December 2013
Cover Photograph	Centre for Indian Knowledge Systems
Cover Design	Vijay R. Subbiah and S. Ramesh
Typesetting	S. Ramesh
Design Consultant	Pavithra Sankaran
Published by	Centre for Indian Knowledge Systems (CIKS) Seed Node of the Revitalising Rainfed Agriculture Network
Financial Support	Revitalising Rainfed Agriculture Network
Copies can be had from	Centre for Indian Knowledge Systems, No.30,Gandhi Mandapam Road, Kotturpuram, Chennai – 600 085 Ph: (044) 24471087, 24475862 Email: info@ciks.org /ciksorg@gmail.com Website: www.ciks.org The RRA Network, Secretariat WASSAN, House No. 12-13-450 Street No. 1, Tarnaka Secunderabad - 500 017, Andhra Pradesh. Email : secretariat@rainfedindia.org Website : www.rainfedindia.org
Printed by	PM Digital Products ‘Konar Maligai’, 25, Peters Road Chennai - 600 014.

PREFACE

The Revitalizing Rainfed Agriculture Network (RRAN) is a growing network of civil society organizations, research institutions, policy makers, donors and individuals engaged in evolving a differentiated agricultural policy with enhanced public investments and support system for rainfed areas in India. Based on the vast experience on the ground and analysis of issues, RRA Network is evolving specific propositions on various aspects of rainfed agriculture such as seeds, soils, water, crop systems, millets, livestock, fisheries, credit, markets and institutions. The Comprehensive Pilots (CPs) are part of the RRA Network's action research programme that seeks to establish evidence and experience on the ground, in support of the various propositions that the Network has developed. In order to offer support for CPs a set of organizations have been identified as Nodes on specific identified themes such as – seeds, soils, water, millets, fisheries, livestock, credit, markets and institutions.

The Centre for Indian Knowledge Systems (CIKS) has been identified and functioning as the nodal anchor for the theme of seeds. The CPs started functioning in the year 2012 and in June 2012 the seed node convened a meeting of representatives of CPs for an inception workshop in Chennai. During this workshop the CPs shared their proposals and plans of work as well as their thinking about the work that they plan to undertake in the area of seeds. Presentations were made during the workshop on how to undertake a situation analysis with respect to seeds, the elements of designing a robust seed system for rainfed areas and also about undertaking a planning exercise through which each CP can proceed towards the establishment of a robust community managed seed system in its area of work. A part of the workshop was to identify the specific needs expressed by each of the CPs in terms of the support and help they would need in the area of seeds. A beginning was made in terms of the capacity building exercise through a series of presentations.

Beginning from the early part of the year 2012 Dr. G. Venkat Raman of the Seed node had started making a series of visits to various CPs. During the visits he provided help and assistance to the CPs for performing situation analysis, evolving a plan for a robust seed system for the area undertaking capacity building exercises and also trying to create linkages between the groups and scientists and institutions who could provide technical support. During this process he also identified various needs in the form of topics on which training and capacity building was required.

Subsequently, on two different occasions when the seed node team met the CPs – in Bagli in Madhya Pradesh in November 2012 and in Tiptur in Karnataka in December 2012 there were opportunities to review the progress of each CP as well as provide technical inputs and training. Earlier this year, towards the end of July 2013 a workshop was held by the seed node in the CIKS Technology Resource Centre in the Kancheepuram district of Tamil Nadu. In this workshop a series of technical trainings were provided on various aspects of seeds. The training was not only in the

form of lectures and presentations but also included field work, experiments, visits to government and private seed farms and seed production centres as well as meetings with the officials of the Directorate of Agriculture and Seed Certification departments. During these meetings drafts of some of the technical training modules that were prepared were circulated and comments and suggestions were sought from the CPs. Based on these efforts and also building upon discussions that took place during the visits to CPs a set of topics had been identified to produce training modules. We expect this process to be dynamic and interactive so that changes can be made based on the suggestions received from the various user groups. A series of reports and books that have been circulated and discussed as drafts and presentations are now being brought out as publications.

A.V. Balasubramanian
Coordinator RRA Seed Node

Centre for Indian Knowledge Systems
Chennai, December 2013

About this Book

This booklet is meant to serve as a resource manual and guide for community based organisations to carry out a sitution analysis specifically focused on the seed system. This is not in the nature of a recipe book with definite steps or precise descriptions, but more in the nature of sharing thoughts and ideas as well as illustrations from one particular area.

CONTENTS

CHAPTER I : INTRODUCTION

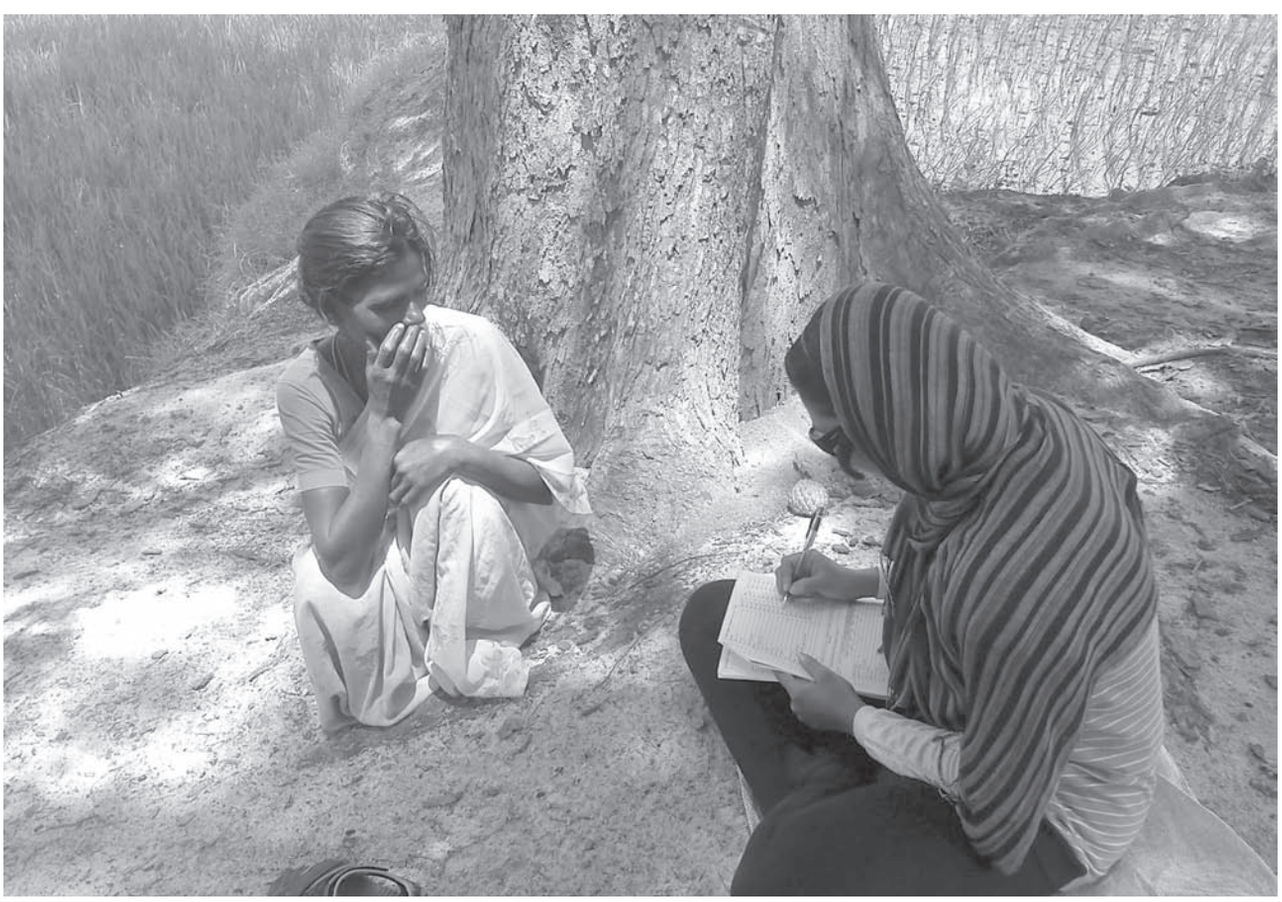
Towards a Robust Seed System for Rainfed Areas

A view from the field tells us that the currently existing seed system is not meeting the requirement of rainfed areas. One of the tasks of the RRA network is to work towards a robust seed system for rainfed areas identifying the needs, the characteristics of the seed system and then plan and design an architecture so that it may be embedded in and interact with the State/formal institutions. The present seed system in rainfed areas suffers from several limitations as outlined below.

- The seeds available are of poor quality, unaffordable and not accessible on time, when they are needed.
- The needs are not met comprehensively taking care of the main crop, intercrops and needs for fodder, horticulture, home garden etc.
- The system is not designed to meet specific rainfed area needs, such as - repeat sowing and contingency / alternate crops.
- There is very little scope for selection, improvement and seed production based on good indigenous varieties.
- The seed supply system is increasingly under the influence of private traders – the portfolio of seeds offered by them is dictated by profit rather than local requirements.
- Inability to access good quality seeds and subsidies even when they are available due to institutional limitations and high transaction costs while interacting with the government seed system and research agencies.

Three Step Process

Moving towards a robust seed system for rainfed areas is a three step process involving the following stages.

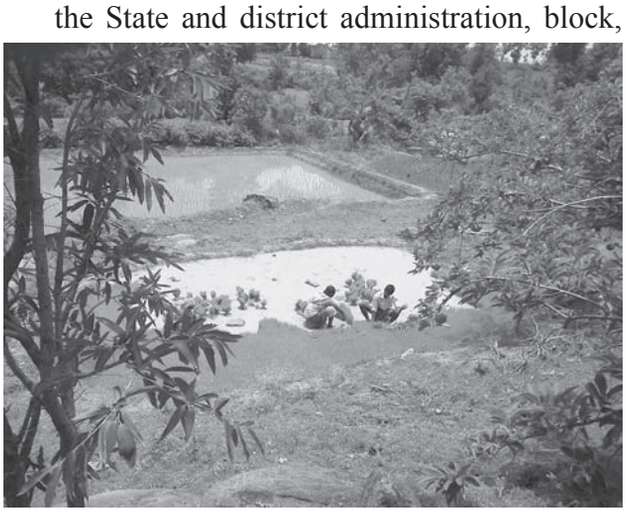


1. **Situation Analysis:** Taking stock of the current situation in the field in rainfed areas.
2. **Awareness, Understanding and Planning:** Conceptualization of rainfed seed systems, Basic understanding of seed, its quality, diversity, production, process, storage, supply, articulation of characteristics and design for a robust system.
3. **Execution:** Working towards a robust system to make it possible.

This Booklet – Objective and how to use it

This booklet is meant to serve as a resource manual and a guide for community based organizations who wish to undertake the exercise of carrying out a situation analysis specifically focused on the seed system. We must emphasize that this is not in the nature of a recipe book which has a specific sequence of steps with precise descriptions of the things to be done and how they are to be done. This is more in the nature of sharing thoughts and ideas about how the process can be initiated. Each field area is very different from every other area in several ways and we give some illustrations below.

1. The landscape would vary in terms of the physical terrain – it may be mountainous, forested or coastal / inland.
2. The cropping system may be highly diverse or may have only limited diversity.
3. The extent of modernization and penetration of market forces would be different in different areas.
4. The availability of secondary data from various government sources including – the State and district administration, block, taluk and panchayat agencies, Department of Agriculture, revenue officials and agencies etc., vary in different areas and even if the data is available the access to it may be limited or slow or not possible.
5. The CBO itself may have different degrees of previous engagement or work with the community.
6. The CBOs own experience and expertise relating to the thematic area of seeds will also determine the extent to which information of a technical kind may be collected.



Hence each CBO has in some sense to chart its own course of action depending on all the above factors. In order to help in this process this publication is organized as below.

- An overview of the whole process of situation analysis is provided in the framework of RRA activities placing it in the context of the role that it should play in evolving a robust seed system for rainfed areas.
- The various parts and steps of the situation analysis are listed and described in some detail. The exact extent to which each group would go into this would really depend on their specific situation. It is possible that in the case of CBOs that are just commencing their work in the thematic area of seeds, the activity in the first round would be carried out at a preliminary level. This has to be revisited and refined in subsequent crop seasons or years as the work evolves around this theme. In this sense the various parts and steps may be thought of as a checklist from which one would make a choice rather than a definite sequence that must and should be followed.
- Illustrations and examples. We decided that the best way to make this process of situation analysis tangible and real would be to share experiences from the analysis that is carried out in any specific area. For this purpose throughout the text we have used illustrations from the situation analysis that was carried out in the Jawadhu hills block of Thiruvannamalai district in Tamil Nadu – this is an area where the Centre for Indian Knowledge Systems (CIKS) is implementing a Comprehensive Pilot (CP) programme.

- In order to make the process more realistic we have also shared at some preliminary level the further steps that follow from the situation analysis including the reflections regarding possible institutional arrangements.

Structure of this Booklet

This booklet consists of the following chapters.

1. Introduction
2. Situation Analysis – Description and Planning
3. Case Study and Illustration - In this section we have provided an outline of the initial situation analysis carried out in one selected CP (i.e., CIKS in Tamil Nadu), the first set of actions and interventions and the learnings from it and then followed this up with a description of the detailed second round of situation analysis which is still in progress.
4. Towards a Robust Seed System - This spells out the requirements of a robust system as it emerges in the case study area identifying the components, linkages and thoughts and preliminary efforts relating to institutional arrangements.
5. A set of annexures including
    - Sources of information and statistics
    - Forms and formats for data collection

Summing Up

We would emphasize once again that situation analysis must be viewed as a continuous process during the course of the work. A preliminary / first cut analysis leads to a first set of actions and lessons drawn from it. Once again enriched with this understanding we must undertake a more detailed analysis and this may also be coupled with the enlargement of the scope of the analysis in several ways – there may be expansion of work to larger geographical areas or a deepening of the work in terms of acquiring additional dimensions or newer activities or a combination of them. For example, one may undertake production of certified seeds – this means that the work would acquire additional dimensions and requirements in terms of selection and training of farmers, selection of locations for seed production, linkages with seed certification agencies etc. In this sense the exercise is not something that is completed or closed. This is also reflected in the structure and content of this book.

CHAPTER II : SITUATION ANALYSIS - DESCRIPTION AND PLANNING

What is Situation Analysis?

Situation analysis is an approach and method for analyzing the existing situation, trend and factors influencing the particular system before making final decisions on the program design and strategy. Situation analysis includes an analysis of the state and condition of the

- Agro-ecosystem and cropping systems
- Land holding and resources
- Crops and cropping patterns,
- Sources and supply of seeds and other inputs
- Quality of crops and seeds
- Yield and economic returns
- Farmers, their skill and knowledge

Institutional Framework for Intervention

The situation analysis should also include the identification of key stakeholders, of course, an assessment of the capacities of the CBO which carries out the analysis and is proposing an intervention is also needed. This should include identification of

- Key stakeholders – farmers, farmer groups, farmer organisations / Federations and Producer companies with respect to their resource availability and their management, finance availability and their management.
- SWOT (Strengths, Weakness, Opportunities and Threats) of a group or organisation.
- Other stakeholders like Government Departments, Institutions, Universities.
- Any innovation or experience from farmers, groups and NGOs.

The Outcome of the Situation Analysis

What would we plan to achieve as a result of the whole exercise? We must expect that this would bring out major issues related to the following themes and also identify gaps and issues that require attention for each of the following.

- Seeds and seed systems
- Crops and cropping systems
- Farmers and their resources as well as
- Farmer groups and organisation

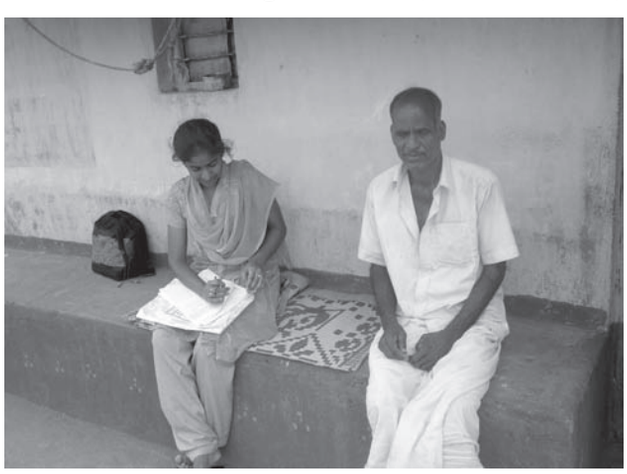
Designing a Programme and Strategy to Address Identified Issues

Once the situation analysis is carried out it can be used to design a programme and a strategy to address identified issues. One must also prepare a road map to ensure that one can move purposefully from the current situation to a desired situation by fixing indicators.

Guiding Principles of Situation Analysis

Our experiences shows that the analysis will be limited or lacking in depth if it has only the macro picture or if it has only of the micro picture. There has to be a role and place for both of them and the following may be considered as the guiding principles.

- **Participatory approach:** It should be carried out with key partners and stakeholders in an area.
- **Outward looking:** We must ask what others are doing, what is working and not working and why?
- **Using framework of farmers and agro-ecosystem :** Work out in farmers perspective and their farming conditions; their interests,



resources, skills and knowledge, income etc.

- **Data based:** One part of the analysis must be data based analysis (qualitative and quantitative) of issues, trends affecting the farmers, cropping systems, seed systems and institutions.
- **Anecdotal :** There is also a value to compiling experiences and efforts of experienced individual farmers and organizations particularly those that may not be captured by the formal research and reporting system.
- **Secondary data sources:** Information from various Government sources including – Departments of Agriculture, Economics, Statistics, district and taluk records etc., are also extremely important.

Steps Involved in Situation Analysis

1. Define boundaries of the area to be covered in the situation analysis. (Village, GP or Block).
2. Research and describe the current status of agro-ecosystems, soils, resources, water, crops and cropping systems, seeds and seed systems and institutions.
   a. Farmers : Social, land holding, skill and knowledge, finance availability and income and other livelihood sources
   b. Farming conditions : natural resources, bio resources, water, soil, crops, varieties and acreage and cropping pattern in each cropping system, seed quality, seed diversity, availability, time of supply, sources etc.
   c. Institutions : SHG groups, farmer groups, Farmer associations, co-operatives and producer companies, seed banks, seed institutions, private and public sector institutions.
3. Identify trends, pressures, driving forces and responses: Describe trends in changes of cropping systems, crops, varieties, cropping pattern, input usage, productivity, income, seed availability, seed diversity, seed sources and seed quality.
4. Identify major issues : Related to farmers and farming systems (Crops, seeds, inputs, finance, institutions and other resources).
5. Identify major areas/subjects that needs more attention.
6. Identify key stakeholders who are part of the present systems and who can change the existing systems. Identify stakeholders - Primary (farmers), secondary (CBOs, NGOs, Pvt. and Public sector institutions) and key stakeholders from the State (Dept. of Agriculture, Rural Development etc).
7. Identify stakeholders' interest, potential impact, power and influence.
8. Design stakeholders' participation strategy and plan of action to implement the programme.

Characteristics of a Robust System

What is our comprehension or image of a robust seed system for rainfed areas? It is essential to have a clarity on this aspect since this is what spells out – "where we are heading …." and in a sense all our plans for intervention will be guided by this. In this connection we can lay down a few basic principles in terms of what would be the characteristics of a robust seed system for rainfed areas. In each case we have also given a brief outline of the principle.

1. Must Comprehensively Meet the Basic Needs

The seeds must be of good quality and in sufficient quantity. Seeds or planting material must support Agro-biodiversity and ensure mixed cropping and diversified cropping systems. They must be at affordable prices and accessible to all rainfed farmers. The supply must be timely, before the sowing period. They must meet varied requirements of major crops, intercrops or crops, fodder, green mulch crops, bio mass plants, horticulture, home garden etc. There must be a provision for repeat sowing when required as well as provision for contingency and alternate crops.

2. To be Aware of and Build on Local Resources

It must take note of and assess the locally available biodiversity and varietal diversity. It must have a process for comparative assessment of performance of local and other varieties in a

situation specific manner. It should consider the possibilities of improving local varieties through processes such as mass selection and participatory plant breeding exercises.

3. Build on Indigenous Knowledge and Practices

The seed system must have knowledge of local crop types and seed varieties and other peculiar or specific priorities with respect to factors such as - local soil types, resistance to pests and diseases occurring in the area and crops suitable to specific crop seasons and / or the local ecosystem. Knowledge of nutritional and therapeutic properties of local varieties is important. Equally important would be qualities such as drought resistance, flood resistance etc., which are essential particularly during times of crisis. It must have awareness of and build upon local traditions, innovations and practices.

4. Suitable Institutional Framework for Self Regulation and Growth

An institutional framework is required that can attend to varied needs such as procurement/ purchase, storage, distribution, exchange and sale of seeds. Physical infrastructure for the above including space for storage, trials, demonstrations etc., is also essential. Ideally one must acquire the capacity to carry out trials, observations and experiments which may be built gradually over time. One must be able to assess local requirements, pool and collect the needs through indents and provide the advantage of collective action and bargaining, dealing with government agencies, private agencies and other NGO networks. The seed institution must be managed by key stakeholders. It should function in a democratic way. Ideally it should be decentralized reaching up to the village level. Most importantly the seed institution must have financial stability.

5. Interfaces with Government, Private Agencies and Other Institutions

6. Education, Awareness and Learning

At least a minimum level of education and awareness regarding seeds, their importance, their priorities and proper utilization must be given to all members of the farming community. Training and awareness are required specifically for farmers who are involved in seed production, demonstration and eventually in testing and experiments. There must be an awareness of legal and regulatory framework relating to seeds - Seed Act, Protection of Plant Varieties and Farmers Rights Act, Biodiversity Act etc.

EXECUTION: Working towards a Robust Seed System

In a situation analysis the starting point would be – a situation analysis and characterization of the requirement. From this one must build capacity towards a robust seed system will include elements such as –

- Awareness and training programmes and with continuous support
- Setting up and maintenance of physical facilities and infrastructure
- Identifying the various government programmes and the possible interfaces of the local seed effort with the various programmes
- Learning and exchange with other RRA partners through exposure visits and other means.

CHAPTER III : CASE STUDY AND ILLUSTRATION OF SITUATION ANALYSIS

In this chapter we are summing up the approach to situation analysis in four different stages as follows :

A. Initial situation analysis : First stage

B. Baseline studies

C. First set of actions and interventions

D. Detailed situation analysis – second round of work in progress

CIKS started working in the Jawadhu hills block of Thiruvannamalai district in Tamil Nadu for over three years before the commencement of the RRA Pilot project. Our work commenced in 11 villages in the panchayat of Kovilur in Jawadhu hills block encompassing a range of activities including – organic cultivation of millets, varietal plot trials, setting up of home herbal gardens, introducing package of practices for organic cultivation of various crops etc. These activities were done in an institutional framework where organic farmers sangams were formed in the villages and they were helped to get their land certified organic. Building on our experience of three years, we commenced a comprehensive set of activities for the revitalization of rainfed agriculture in this area as part of the RRA programme.

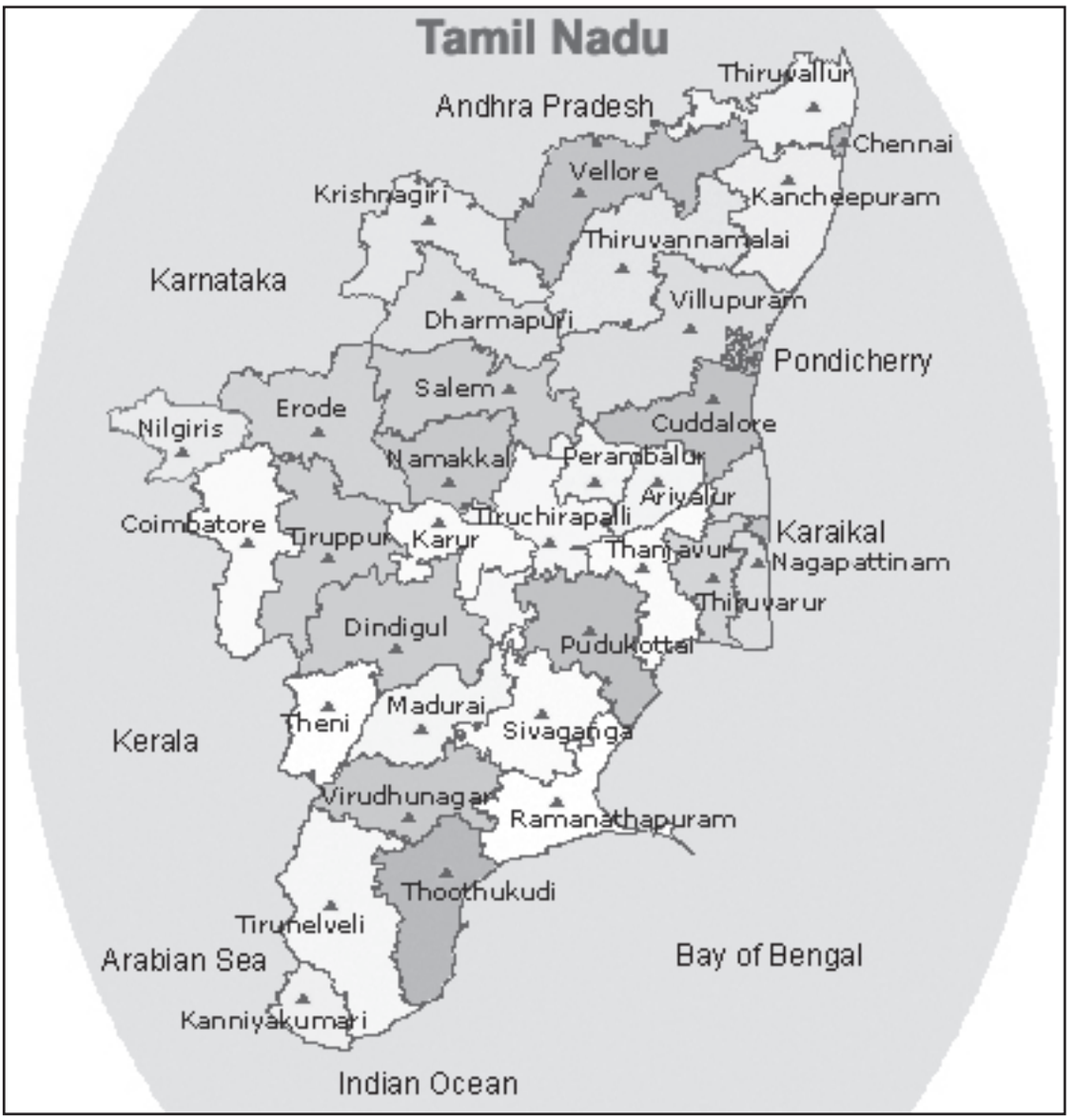
A. INITIAL SITUATION ANALYSIS: FIRST STAGE

1. Location and Agro-Ecology

Thiruvannamalai district which is one of the 32 districts in Tamil Nadu State came into existence in September 1989 after the bifurcation of the erstwhile North Arcot district. The district lies between 11.55° and 13.15° North latitude and 78.200 to 79.500 East longitude. The total geographical area of the district is 6191 sq. km. comprising the Revenue Divisions of Thiruvannamalai and Cheyyar. The district has seven taluks and 18 blocks including one tribal block which is the Jawadhu hills block. The district is bounded on the North and West by Vellore district and on the South West by Dharmapuri district on the South Villupuram district and on the east by Kancheepuram district. One sixth of the area of this district is covered by reserve forest and hills which is part and parcel of Eastern Ghats under Jawadhu hills. The important hills in this district are Thiruvannamalai (2668 ft MSL), Jawadhu hills (2500 ft MSL) and Kailasagiri (2743 ft MSL). The red, loamy soil is predominantly found here. The general climate is tropical. The district receives rainfall from North East and South West monsoons. The total rainfall during 2009 - 10 in the district was 957 mm. There is no perennial river in the district. Cheyyar, Thenpennai, Kamandala Naganathi are only seasonal. The total population of this district is 21.86 lakh comprising 10.96 lakhs men and 10.90 lakhs women as per the 2001 census. The urban population is 4.00 lakhs constituting 18% of the total population, the remaining 82% i.e., 17. 85 lakhs is rural population. The density of the population is 352 per sq.km. The SC & ST population is about 4.68 lakhs. Paddy, groundnut, sugarcane, millets and pulses are the major crops. The district is considered as the leader in white revolution among the districts in Tamil Nadu.

Eastern Ghats - Ecological Problems and Constrains

While our focus will be on a single block in the districts the entire region is characterized


Tamil Nadu
Thiruvallur
Andhra Pradesh
Chennai
Vellore
Krishnagiri
Kancheepuram
Thiruvannamalai
Karnataka
Villupuram
Dharmapuri
Pondicherry
Salem
Erode
Nilgiris
Cuddalore
Namakkal
Perambalur
Ariyalur
Coimbatore
Tiruchirapalli
Karaikal
Tiruppur
Karur
Thanjavur
Nagapattinam
Thiruvarur
Dindigul
Pudukottai
Madurai
Theni
Kerala
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Ramanathapuram
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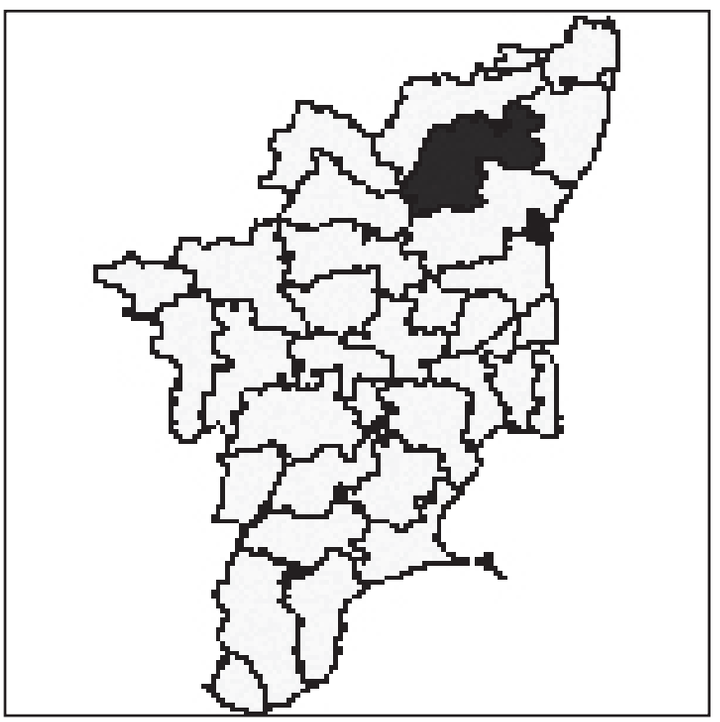
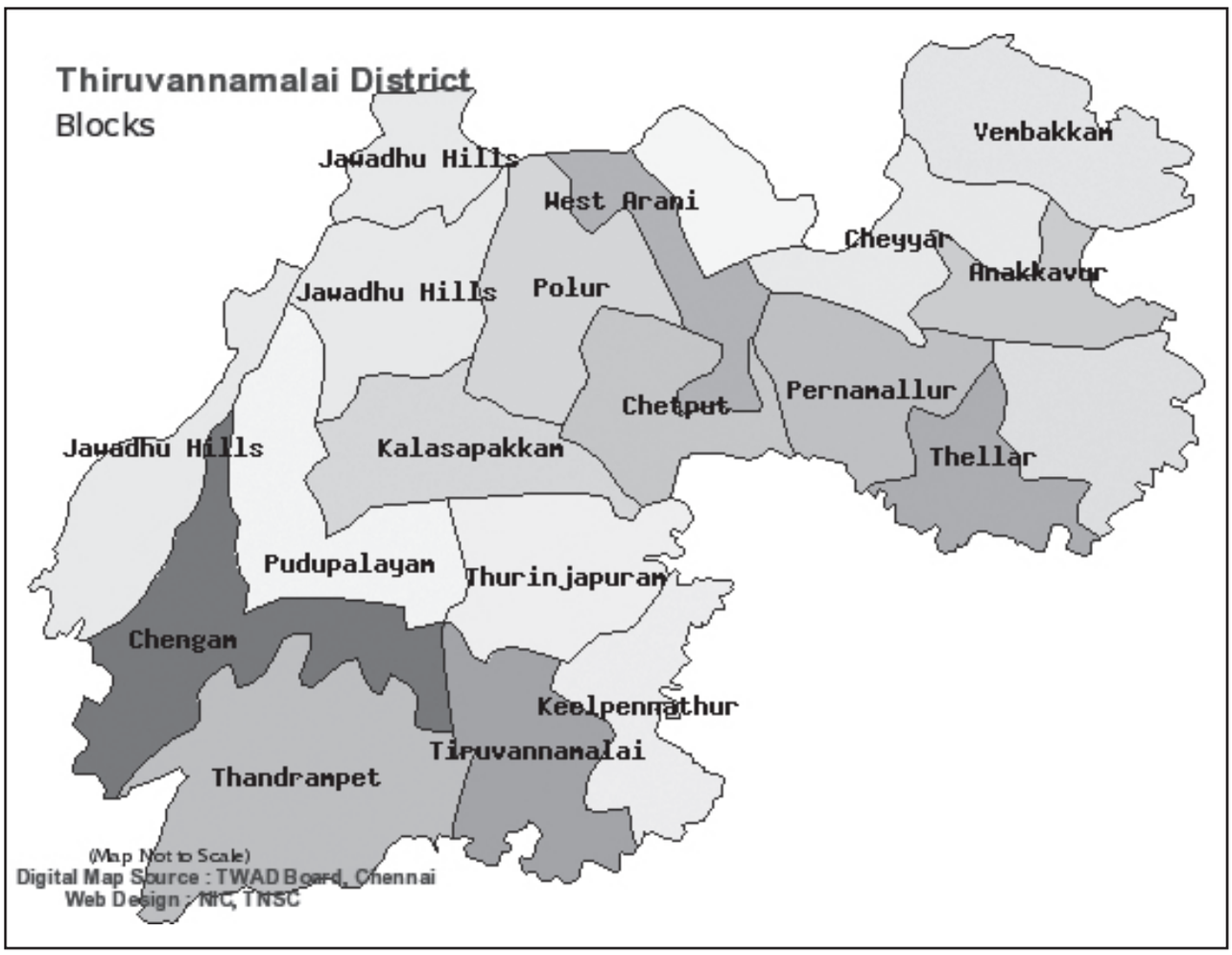
Arabian Sea
Bay of Bengal
Kanniyakumari
Indian Ocean




Thiruvannamalai District
Blocks
Jawadhu Hills
West Arani
Venbakkam
Cheyyar
Anakkavur
Jawadhu Hills
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Chetput
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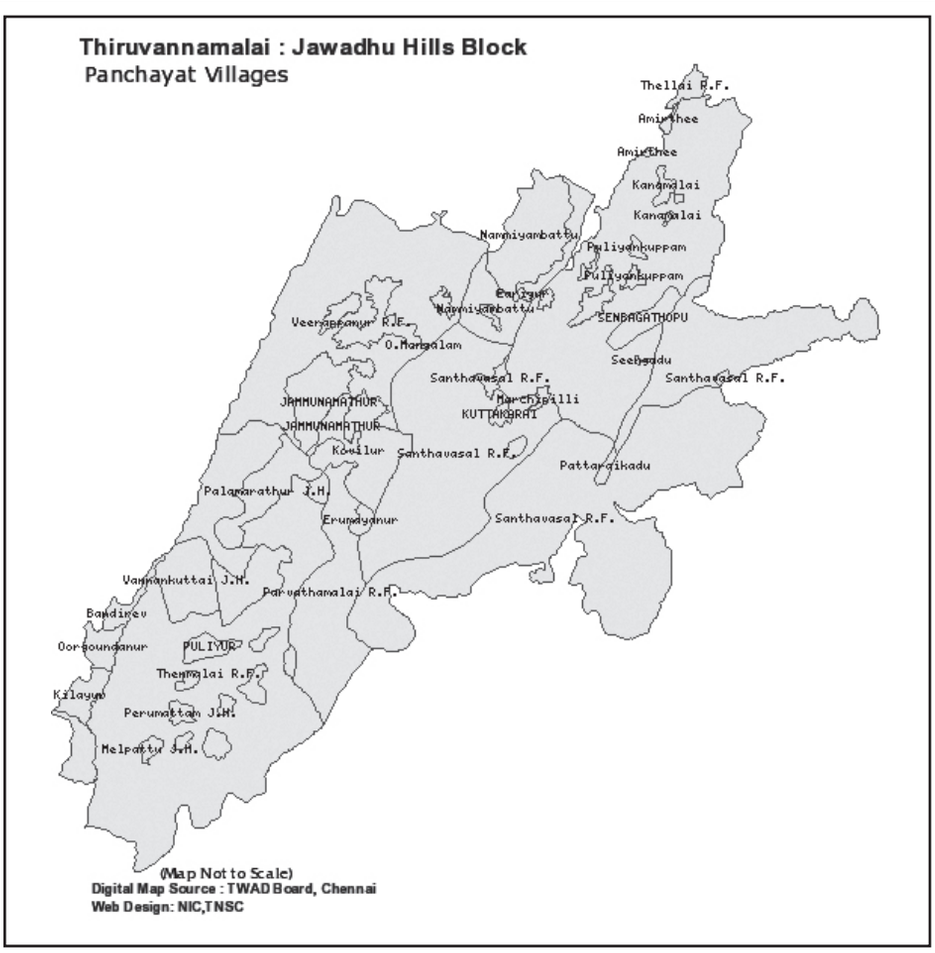
Kalasapakkam
Thellar
Pudupalayam
Thurinjapuram
Chengam
Keelpennathur
Tiruvannamalai
Thandrampet
(Map Not to Scale)
Digital Map Source : TWAD Board, Chennai
Web Design : NIC, TNSC


Thiruvannamalai : Jawadhu Hills Block
Panchayat Villages
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Amirthee
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Seebadu
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Marchipalli
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(Map Not to Scale)
Digital Map Source : TWAD Board, Chennai
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by certain problems and constraints that are common to the Eastern ghats region. Hence, it is appropriate to have an overview at this level here. The Eastern ghats are located between 77 22' and 85 20' longitude and 11 30' and 20 00' N latitude. They are scattered and broken. Much of the ghats is of lower altitude than Western Ghats. Beginning in North Orissa, they pass through the coastal region of Andhra Pradesh to Tamil Nadu cutting across Karnataka. Their average elevation is about 610 m. Eastern Ghats receive rainfall of about 600 to 1400 mm, which is less than that in Western Ghats. Because of their lower elevation and their broken character, traversing across the Eastern Ghats is much easier. The average width of the Eastern Ghats is about 125 km (ranging from 40 to 240 km) over a length of 1600 km between the rivers Mahanadi and Vaigai along the east coast.

Eastern Ghats in Tamil Nadu

The Eastern Ghats in Tamil Nadu are spread over an area of about 98,000 sq. km. The Eastern Ghats are not contiguous and they are spread over a vast area in Tamil Nadu. The Eastern Ghats region in Tamil Nadu can be divided into three major sub-regions, viz (i) The Coastal Eastern Ghats (ii) The Central Eastern Ghats and (iii) The Southern Eastern Ghats. The Coastal Eastern Ghats region comprises of rocky out crops with loose boulders, scattered hills and ecologically vulnerable areas abutting the low hill region. The Southern Eastern Ghats covers the small hill ranges of Sirumalai and Karanthamalai ranges in the southern parts of Tamil Nadu. The Central Eastern Ghats has the medium high hill ranges of Jawadhu hills, Pachaimalai hills, Chitteri hills, Kalrayan hills, Servarayan hills, Kolli hills, Mettur and Palamalai hills, Bargur hills, Bhavani and Biligiri Rayan hills. The area falling in Eastern Ghats are ecologically very sensitive. These areas are the catchment area for various rivers which feed more than 32,000 tanks downstream, a store house of vast array of biological diversity including medicinal plants, and are inhabitated by a fairly large tribal and other population who are economically poor. The Eastern Ghats includes about 83 watersheds.

Tribes in the Eastern Ghats

There are about 49 major tribes are inhabiting the Eastern Ghats. The major tribes in the Jawadhu hills and Yelagiri are Malayalis. In the Jawadhu hills block the population is almost entirely tribal 98% of them belong to the Malayali tribes.

Problems and Constraints of Resource Management

Some general problems and constraints are outlined below:

- Soil erosion due to shifting cultivation.
- Large scale deforestation, destruction of native germplasm and erosion of biodiversity.
- Poor fertility status of soils and low fertilizer application gives low yield per hectare.
- Degraded and gullied common lands and grazing lands due to large-scale exploitation.
- Lack of information on farming and cropping systems suited to different locations.
- Lack of improved water management systems and practices in the area.
- Stream bed cultivation for paddy leading to downstream siltation.
- Incidence of fire due to phases of burning during process of shifting cultivation.
- Low economic status and low adoption pattern of the rural population.
- Fragmentation of holdings.

Jawadhu Hills Region

Jawadhu hills are spread over the border taluks in two districts of Tamil Nadu namely the Polur

and Chengam taluks of Thiruvannamalai district and Tirupatur, Vaniyambadi and Vellore taluks of the Vellore district. The hills lie between 78.35 and 79.35 degree East longitude and 12.24 and 12.55 North latitude on an area of 2,405 sq.km. The hills have a mean elevation of 762 metres with the highest points being 1094 metres. Of the total area, 14% constitutes forests. The hills contain sandal trees which grow widely due to the favourable conditions. The mean annual rainfall is 1,100 mm of which about 480 mm is received in the southwest monsoon period (June – September) and 429 mm in the northeast monsoon period (October – December). About half of the soil of the land is red loamy clay and sandy soil.

Jawadhu Hills Block

Jawadhu hills block is one of the 18 blocks in Thiruvannamalai district. It consists of 11 panchayat villages which in turn comprise of 38 villages. A list of the constituent panchayat villages and the villages is given below.

List of Panchayat Villages in Jawadhu Hills Block

1. Kallathur
2. Kanamalai
3. Kovilur
4. Kuttakarai
5. Melsilambadi
6. Nammiyambat
7. Palamarathur
8. Puliyur
9. Thenmalai Athipattu
10. Veerappanur
11. Veergoundanur

The block has an area of about 150 sq.km and a population of 43,320 persons. Of the 38 villages a predominant number of them (15) have population between 200 – 499 persons and eight have population between 500 – 999 persons. About eleven villages are larger with population of over 1000 persons of which one has a population of more than 10,000 persons. The remaining three villages have population of less than 200 persons. The population is predominantly tribal comprising 98% of the total population and these consists mostly of Malayali tribes. There is a small percentage of scheduled caste present consisting of the Arundithiyar community. The accompanying table gives a list of 38 villages with households, population and area.

LIST OF VILLAGES IN THE JAWADHU HILLS BLOCK WITH BASIC DETAILS OF POPULATION, HOUSEHOLDS, AREA, CULTIVATORS AND AGRICULTURAL LABOUR

Sl. No.	Name of the Village	Total No. of House holds	Popu-lation	Area (Sq.Km)	Culti-vators	Agricul-tural Labour
1.	Amirdee	257	1128	3.54	186	149
2.	Athipattu	89	392	0.58	211	2
3.	Bandirev	163	824	2.47	262	216
4.	Chinnakilpattu	53	205	0.57	54	62
5.	Eriyur	782	3270	0.60	1253	271
6.	Erumaiyanur	93	414	1.03	223	13
7.	Erukambattu	44	222	0.77	90	27
8.	Kallathur	318	1329	4.76	523	304
9.	Kanamalai	196	812	2.20	297	61
10.	Kilaiyur	190	842	4.13	226	213
11.	Kilpatu	84	320	1.66	159	10
12.	Kilthathiyapattu (C)	19	82	0.20	41	3
13.	Kilkanavayur	123	537	0.72	149	157
14.	Kilthathiyapattu (P)	20	94	0.20	50	4
15.	Kovilur	2417	10384	36.79	3088	1333
16.	Kuttakarai	271	1181	1.04	333	334
17.	Mandaparai	202	949	2.04	292	195
18.	Melpattu	71	296	1.17	127	40
19.	Melsilambadi	415	1938	11.03	645	105
20.	Melchppili	92	371	0.69	187	7
21.	Melthathiyapattu	53	229	0.59	99	18
22.	Nanniyambut	687	2979	17.43	760	827
23.	Neepalampattu	40	188	1.51	16	68
24.	Nellivoy	85	320	1.60	188	5
25.	Padapanjamarathur	118	491	3.90	271	31
26.	Palamarathur	663	2960	22.94	1268	201
27.	Pattarvaikadu	102	432	0.47	87	17
28.	Perumuttam	52	227	12.9	124	1
29.	Pudupattu	129	586	1.92	380	6

30.	Puliyankuppam	238	1119	2.59	326	207
31.	Puliyur	93	381	2.54	69	3
32.	Seengadu	254	1147	1.48	399	209
33.	Senbagathope	245	987	1.28	227	144
34.	Thumbakkadu	302	1241	2.11	404	371
35.	Urgoundanur	168	835	3.48	239	251
36.	Vannankuttai	80	362	0.68	220	0
37.	Veerappanur	696	3010	7.03	971	495
38.	Odamangalam	60	236	1.68	171	16
	Total	**9964**	**43320**	**150.71**	**14615**	**6376**

Land Utilisation, Major Crops and Land Holding

The total geographical area is about 60,000 ha out of which over 75% is forest area and the total cropped area is 8,712 ha. The major crops cultivated in the block are the following –

- Among the cereals it is predominantly *Samai* (Little Millet) and smaller amounts of Bajra (Pearl Millet) and Ragi. Rice is also cultivated in about 1000 ha. The irrigated land under cereals is by and large under rice cultivation.
- The only pulse that is cultivated in any significant quantity is horsegram in 1236 ha.
- Oilseeds comprise mainly of gingelly (363 ha) and groundnut (73 ha).
- It is seen that there is also a wide cultivation of niger *(pey ellu)* which however, is not reflected in the block statistics handbook.
- Among other crops the significant ones are banana (185 ha), sugarcare (83 ha) and a small amount of coleus, mango and turmeric. Jackfruit which is seen extensively are not noted in the block records.

Of the total cultivated area in the block nearly a third of the area consistutes small land holdings in the range of half to 2 ha while 37% of the area consists of slightly larger land holdings in the range of 2-4 hectares. In terms of irrigation of the total area only about 12.7% consisting of 1086 ha is under irrigation. This is through dug wells that may be with or without pump sets.

Jawadhu Hills Block – Overall Trend and Changes During the Recent Times

Here is an overview of certain general trends and changes that we see at the block level by a comparison of today's situation with what existed ten years back as can be seen by the block statistical hand book information of 2009 – 2010 compared with the block statistical hand book of 1999 – 2000.

- The population of scheduled tribes and scheduled cast have remained about the same percentage of the total population around 98% and 2% respectively.
- Changes in agriculture. In terms of the crop that are being cultivated and the total land under cultivation remains the same. However,-
- The area under rice which was 689 ha has increased to 1049 ha. Jowar has declined from 777 ha to 577 ha and Ragi has halved

from 415 ha to 207 ha. Currently, Little Millet – *Samai*, is cultivated under 4590 ha while ten years back we have the figure as – "Others" accounting for 5536 ha.

- In terms of pulses , red gram (135 ha), black gram (75 ha) and green gram (125 ha) have been wiped out completely. However, currently the pulses cultivated constitute entirely of horse gram (1237 ha) which has not been listed ten years back.
- In terms of oilseeds, groundnut has declined from 650 to 73 ha and coconut from 21 to 4 ha. Gingelly which was cultivated in 645 ha has declined to 363 ha.
- In terms of other crops sugarcane has declined from 265 to 83 ha and banana has doubled from 88 to 185 ha.
- In terms of livestock, cattle has declined from 15151 heads to 13254 heads and buffalo declined sharply from 1434 to 149 heads. There has also been a significant decline in population of sheep from 8494 heads to 2442 heads and goats from 12227 to 7732 heads.
- The 1991 records shows 6962 numbers under – "Other livestock" whereas the current records show it to be only 2.
- The 1991 records show a total poultry population to be 31403 while the current record shows it to be nil.

We feel it is essential that some of these need to be cross checked and verified based on our own assessment and sample surveys. For example, in the area of our work we still see a fair bit of poultry including desi poultry despite the fact that the government records show it to be nil as of today. However, we can see that there is a sharp decline in biodiversity and cattle, millets are less diverse and pulses have been wiped out.

Problem Analysis

We present an overview regarding the analysis of the problems in the area. These are based on – our three year experience in this specific area, as well as our experiences in other dryland areas of Tamil Nadu backed up by study and analysis of records and documents. This has also been enriched considerably by our interaction with other members of the RRA network and their experiences.

At a very general level the area faces problems and constraints of a general nature which are shared with many other locations in the Eastern Ghats and these are – significant decrease in the cultivation of millets and dryland crops, decline of soil fertility and erosion, poor fertility status of soil and low level of application of any input to enrich the soil particularly farmyard manure or compost, degraded and gullied common lands, lack of information on farming and cropping systems suited to the area, agriculture that is increasingly vulnerable due to the changes in the pattern of rainfall.

More specifically in terms of issues relating to dryland areas, the following general observations are made

- With respect to seeds there are problems of availability of the choice seeds, availability of the required seeds (particularly to meet problems due to delayed rain or failure of rains), timely availability or accessibility as well as quality (poor germination and vigour of seeds)
- With respect to soil fertility there is soil erosion, sharp decline in availability of farmyard manure due to decrease in cattle, tendency towards monocropping, decline of crop rotation, lack of testing services and lack of access to good quality biofertilisers.
- With respect to cropping patterns the crops cultivated have become less diverse and mixed cropping practices have declined. The diversity of millets cultivated has declined and most alarmingly pulses have almost completely disappeared. Redgram, blackgram and greengram that were cultivated ten years back are now completely absent in that area.
- With respect to millets there is a problem of availability of quality seeds, decline in yields and most importantly most of the millets cultivated are sent to the market outside. Due to lack of modern processing facilities (and decline of traditional processing methods) there is a sharp decline in the local millet consumption.
- The outreach of the government extension system is very poor with the presence of the agriculture department seen only with respect

to paddy which constitutes only 15% of the cropping area. There is poor knowledge and awareness of entitlements and various government schemes.

While this presents a general overview of the problems as we see it a more detailed analysis of issues relating to seeds are presented below.

2. Seed Systems

Issues Related to Seeds in the Project Area

- Ten years back there were traditional varieties of rice like *Maduvu Muzhungi* which was cultivated widely. They also had several varieties of little millet like *Chittan samai, Vella samai* and *Perun samai.* Most of these were long duration varieties. These have been now replaced by short duration varieties and improved varieties. There is no seed production in the block. Farmers have no concept of how seeds should be produced and how it is different from the general grains.
- Seed replacement is not being done.
- Availability of seeds – seeds are not available within easy reach; farmers use their own or neighbour's seeds, which has admixtures and are of poor quality standards; non-availability of seeds that are drought resilient, pest resistant, performing under poor soil conditions, providing good yield etc.
- Non availability of green manure seeds which is a major requirement for increasing soil fertility.
- Seeds are not available in time and seeds for late season are not available.
- Farmers cannot afford to buy good quality seeds.
- Fodder seeds availability is nil – a real need for livestock which is quite large in this area.
- Non-availability of good quality seeds for home/herbal gardens.
- The millet seed procurement and distribution through the agricultural sector is extremely low. It was only for 105 beneficiaries with a 3 metric tonnes millet seed distribution for the entire district in the year 2008. This indicates

that there are no proper seed distribution systems in place for millets at all.

Interventions Needed

- Ensuring good quality seeds, available on time at affordable prices at all times within easy reach – this will ensure high productivity and fodder availability throughout the season.

Proposed Intervention Strategies

- Seed cultivation by selected local farmers – identify farmers, training to farmers in seed production technology, system for collection, storage and marketing of seeds (seed bank approach) – this approach can meet part of the total demand; the rest can be brought from Government or private agencies.
- Certification for selected varieties which are not certified so far through Participatory Guarantee Systems (PGS) method; accessing subsidy from Government (seed village programme)
- Varietal trials – different trials can be conducted to identify varieties that are most suitable for the region.
- Nursery raising by communities to meet the demands of home/herbal gardens.
- Quality paddy seed distribution through enhanced SRI will be attempted.
- Through home gardens seed production for vegetables will be promoted.

Expertise Available with CIKS in this Area

CIKS has been working in the issue of seeds in Tamil Nadu for the last 18 years. It has been involved in conservation of a large number of indigenous paddy varieties and vegetable varieties and also certain oilseeds, millets etc., It has been experimenting with varieties suited to specific soil, climate etc., in different agroclimatic regions of Tamil Nadu. CIKS has also been involved in the production of seeds of paddy, vegetables, pulses and oilseeds (both certified and truthfully labeled). It has been training farmers to do the same. For the first time in Tamil Nadu farmers have produced doubly certified seeds (Organic and Certified seeds). For seed production CIKS has worked closely with the Department of Seed Certification and has also been able to link the subsidies for farmers in this programme in Nagapattinam and Tamil Nadu. CIKS has vast experience in setting up community based seed banks. Documentation and experimentation with varieties of millets has also been done in a small area in the proposed Jawadhu hills block. All these experiences of CIKS will be drawn upon for work in this area.

B. BASELINE STUDIES

CIKS and our project partner Vrutti Livelihood Resource Centre (VLRC) designed a study to understand the baseline situation and develop key bench marks of performance indicators so that the achievement of the project intervention can be measured. The key focus areas were – socio-economic profile, Natural Resources Management (NRM), seeds and other agricultural inputs, crop management practices, value addition, marketing and credit facilities, livestock and home gardens. The RRA CP project intended to cover 503 direct households from 10 villages. These 10 villages were in the Kovilur Gram Panchayat. It was tested out using 95% confidence level and confidence interval of + / - 5. It was concluded, that a sample of 218 randomly selected households will give significant results bearing an attrition rate of 15% between baseline and endline. It was decided that the total samples need to be covered is 251. The number of households in each village was taken proportionately and within each village the results were consolidated using – systematic random sampling. The key findings as well as the way forward identifying opportunities are summarized and given below.

Key Findings of the Study

The study population is homogenous in terms of socio-economic characteristics; with 98% belonging to scheduled tribe, 90% households are male headed, about 2/3rd are illiterate and for 99% of households the primary source of energy for cooking is firewood. Over 50% of the households do not have tribal certificate which is essential to be eligible for availing various entitlements. For more than 90% of the households the primary occupation is agriculture. As for landholding, about 92% of households own dry lands and of which 97% have less than five acres of lands. In the case of irrigated lands, less than 30% own

these lands and of which 97% have less than 2.5 acres. Around 160-200 days of employment in a year is reported by the households engaging in agriculture. The study reveals that the average annual household income has been less than Rs. 40,000 (Rs. 3333 per month) for 70% of the households. The socio-economic profile of target justifies the targeting and appropriateness of project intervention.

About one-third of the households each have membership in women SHGs and farmers' club and 9% of households have representation in village poverty reduction committee. Barring a few subsidy schemes such as fertilizers/pesticides and seeds/sapplings, generally the awareness levels and capacities to realize entitlements has been 'very low'.The level of awareness and regular adoption of soil fertility retention and improvement practices have been low among the farmer households except for 'use of organic manure application'. A little over 85% of the respondents were not aware where the nearest soil testing facilities were located. While 8% of the households access soil testing services, the frequency of testing is once in two years. The knowledge and practices related to soil and water conservation such as contour bunds, farm bunds, ploughing across the slope etc., are reasonably good. However, the awareness on cover crops, intensive/inter cropping and mulching is limited.

Seeds Situation

Sittan samai variety is the predominant rainfed crop cultivated during Kharif season by more than 90% of the households. Of those cultivating this variety, a close to 90% use their 'own seeds' and the rest buy from neighbours, local agents, private traders and Government Departments. The average seed rate is 25-35 kg/acre as reported by more than 3/4th of the households. The common practice in the region for all major crops has been, after harvest farmers hold back a small portion (based on the size of lands) of grains to be used as seeds for the next crop season. Hence, very few reported seeds related problems like non availability, high cost and poor quality. Maize *Natturagam* (meaning local variety) and Ragi *(Perunkezhvaragu* and *Muttaikezhvaragu* – two local varieties) are the other major rainfed crops cultivated during Kharif season. Among irrigated, Paddy (White *Ponni*) is the predominant crop cultivated during Kharif and Rabi seasons, by 80% of the households who have irrigated lands. While 2/3rd uses their own seeds, 23% buy from private traders and 19% from Agriculture Department. The average seed application rate is 25-40 kg/acre. Horsegram (local variety) and Niger (local variety)are the major rainfed crops cultivated during Rabi.

The findings reveal that the cost of cultivation is 'high' and productivity is 'low' for all these major crops which results in low net income from agriculture. The project has tremendous potential to increase the net income through appropriate technology and training inputs. Barring four, none of the respondent households received any training during the last two crop seasons. Out of the 254 households studied, none of the households were involved in seed production and marketing on a commercial basis. Only 20% households availed credit during the last two crop season and over 80% accessed it from informal sources. However, except for very few, the interest rate from all these sources has been 12% per annum. While one fourth of the households sell their produce immediately after harvest in order to repay the loans, the remaining involve in cleaning (71%), cleaning and grading (20%) and milling/grinding (15%). Apart from their own consumption, over 80% sell their produce through brokers or commission agents. Half of the population is not aware of balanced dietary practices and consumption of vegetables, milk, egg etc., has been inadequate attributed to non-affordability and lack of awareness of its importance. Awareness and practice of home/ kitchen garden has been found to be low.

Way Forward

The findings of baseline study substantiate that the project targeting has been very appropriate covering rainfed region, with focus on marginal and small farmers whose average annual household income are low and below potential. The study also finds that there is tremendous potential and opportunities for the project to address all systemic issues in the entire crop value chain through technical-social-institutional-market based interventions

Opportunities

Programmatic

- Entitlements – the study finds that the level of awareness as well as capacities to realize the entitlements has been very low. It is also observed that less than half of the households possess tribal community certificate which makes them eligible for availing various government schemes and services. The project can create awareness and initiate institution building process.
- Community Institutions – the percentage of households having membership in any CBO is low. As per the project design, the project can promote sustainable agriculture groups at village level and their apex bodies at cluster level (Agriculture Services Facilitation Centre), which can act as effective platforms for facilitation of services related to agriculture and allied services.
- Awareness and adoption of NRM practices – the findings reveal that the level of awareness and adoption of NRM practices has been low. The project has the potential to provide knowledge inputs as well as building demonstration plots so that these resources are well managed.

- Seeds - It has been observed that a majority of the households use their own seeds for sowing. The project can intervene appropriately so that good quality seeds are available to the farmers on time at an affordable cost.
- Other agricultural inputs – the level of awareness and adoption has been low except application of farmyard manure. The project has many opportunities to make products like vermicompost, panchagavya etc. locally available either through individual or collective enterprises. Similarly, the awareness level on organic ways of pest and insect management has been poor which can be addressed through project intervention.
- Cultivation practices – the percentage of farmer households who have attended any training programmes during the last two crop seasons has been extremely low. The project can develop appropriate training packages on improved cultivation practices and conduct trainings in order to reduce cost of cultivation as well as increase productivity.
- Value addition – the level of awareness on post-harvest techniques has been low or limited to cleaning and grading. Appropriate value addition possibilities can be explored by the project which could be taken up through women SHGs/farmer sangams.
- Marketing – the main marketing channels thus far in the region are local traders (brokers/commission agents) and marketing companies. During a review meeting where the draft findings were shared, the importance of conducting a rapid market study has been discussed. The project can immediately explore all possible market opportunities so that the farmers get reasonable share for their produce.
- Credit – it has been observed that of those who availed loans, over 80% obtained it from informal sources. The project has the potential to design appropriate credit products and deliver them through CBOs to improve access to credit for the farmers, especially

marginal farmer. This will also help to make these institutions financially viable.

- Home garden and nutritional security – the study finds that the awareness level on home garden and nutritional security has been low among the respondents. The project can create awareness and support promoting home gardens to ensure nutritional security of the target households.

Strategic

- Planning meeting with key stakeholders during project inception revealed a number of collaboration opportunities with government line departments, NABARD, Don Bosco, DHAN Foundation, Tribal Welfare Department etc. The project can effectively use these opportunities for leveraging and convergence.
- As per the project logic, there are opportunities for the project to work through a comprehensive (addressing all programmatic gaps from soil to table), systems based approach through a community led service delivery model. Given the strengths of CIKS and Vrutti the potential of achieving the outcomes and impact is high.

Challenges

- Addressing issues through leveraging and convergence may take considerable time and efforts. How do we balance between direct intervention and leveraging to create significant impact within specified time.
- One of the causes of the low level of awareness on many areas of assessment could be 'low literacy level'. So, how do we design our training package to address this issue – through field demonstration? or appropriate communication methods?
- How are we going to work with brokers/ commission agents who have well established rapport with the target farmers? Are they stakeholders with negative interests towards this project?

C. FIRST SET OF ACTIONS AND INTERVENTIONS

Based on the initial situation analysis and the overall baseline survey a first set of actions and interventions were planned and implemented in the Kovilur Gram Panchayat area. We provide herein an overview of only those activities that are relevant with respect to seeds. Broadly these pertained to crops such as millets as well as seeds and planting materials in the context of home gardens and horticultural crops. The activities may be summed up broadly under the following categories.

1. Millets – Observation of millets cultivated
2. Seed collections
3. Demonstrations of performance of millets collected
4. Frontline demonstration of CO4 (Little millet) variety
5. Seed multiplication of millets
6. Interaction with the Government – INSIMP scheme
7. Home gardens
8. Interaction with forest and horticulture departments

1. Millets

Millets are commonly referred to a group of small seeded grasses which are widely cultivated as cereals in the semi-arid regions of Asia and Africa. The grains are consumed by humans and the straws are used as fodder for animals. These crops can withstand high temperature conditions and are therefore cultivated mostly under rainfed conditions. Traditionally millets

formed an important staple crop for many of the communities. In recent years there has been a significant decrease in its consumption in favour of other cereals. However, as the millets have certain nutritive benefits, these now are being sought after, especially among health and diet conscious individuals. The nutritive benefits of millets in general are good source of carbohydrates, protein content comparable to wheat, rich in iron, phosphorus, calcium, potassium, magnesium, zinc and B-complex vitamins, high fibre content. Millets are low in gluten. The actual content of the minerals and vitamins vary between the millets.

In Tamil Nadu, little millet crop covers 8.0% (22,292 ha) of the total area under other cereals. It is generally sown in less fertile soil as a mixture crop with pulses throughout the year regardless of the seasons. The main millets crops cultivated at Jawadhu hills project area are given in Table 1.

Table 1 : Millets Cultivated in the Project Area

S. No.	Scientific Name	Common Name (English)	Common Name (Tamil)	Common Name (Hindi)
1.	*Echinochloa frumentacea*	Barnyard millet	*Kuthuraivaali*	Jhangora
2.	*Eleusine coracana*	Finger millet	*Ragi*	Mandua
3.	*Panicum miliaceum*	Proso millet	*Paniveragu*	Barri
4.	*Panicum sumatrense*	Little millet	*Samai*	Kutki
5.	*Paspalum scrobiculatum*	Kodo millet	*Varagu*	Kodra
6.	*Pennisetum typhoideum*	Pearl millet	*Cumbu*	Bajra
7.	*Setaria italic*	Foxtail millet	*Thenai*	Kangu
8.	*Sorghum vulgare*	Sorghum	*Cholam*	Jowar

2. Seed Collection

Providing good quality seed materials of farmers preferred varieties in a timely manner and in the required quantity locally, is one of the objectives of this project. For this purpose, efforts were taken to collect seed materials in the initial phase of the project implementation itself. Millet seed varieties were collected and these are listed in Table-2 below along with the source of procurement.

Table 2 : Millet Seed Varieties Collected

S. No.	Common Name (English)	Collection No.	Varieties	Source
1.	Finger millet	1.	*Bili Munduga*	Sahaja Samrudha, Karnataka
		2.	*Bonda*	Sahaja Samrudha, Karnataka
		3.	CO14	TNAU, Coimbatore
		4.	GPU 28*	Sahaja Samrudha, Karnataka
		5.	*Jagaluru*	Sahaja Samrudha, Karnataka
		6.	*Malali*	Sahaja Samrudha, Karnataka
		7.	*Mutta Kelvaragu*	Sahaja Samrudha, Karnataka
		8.	*Nagamala*	Sahaja Samrudha, Karnataka
		9.	*Pichakaddi*	Sahaja Samrudha, Karnataka
2.	Proso millet	1.	CO5	TNAU, Coimbatore
		2.	Local	Farmer, Jawadhu Hills
		3.		Sahaja Samrudha, Karnataka
		4.	RMD 1	Department of Agriculture, Paramakudi, Ramanathapuram district, Tamil Nadu
3.	Foxtail millet	1.	CO7	TNAU, Coimbatore
		2.	Gross Fox Tail	Sahaja Samrudha, Karnataka
		3.	Mabbu Fox Tail	Sahaja Samrudha, Karnataka
		4.	Traditional variety	Farmer, Jawadhu Hills
		5.	Tree variety	Sahaja Samrudha, Karnataka
		6.	White variety	Sahaja Samrudha, Karnataka
		7.	*Yadiyuru*	Sahaja Samrudha, Karnataka
4.	Barnyard millet	1.	CO-2	TNAU, Coimbatore
		2.	RMD 1	Department of Agriculture, Paramakudi
		3.	SS	Sahaja Samrudha, Karnataka
5.	Little millet	1.	CO4	TNAU, Coimbatore
		2.	IR 20	Farmer, Jawadhu Hills
		3.	IR 8	Farmer, Jawadhu Hills
		4.	*Sitten Samai*	Farmer, Jawadhu Hills
				Sahaja Samrudha, Karnataka
		5.	*Vella Saamai*	Farmer, Jawadhu Hills

6.	Kodo millet	1.	CO3	TNAU, Coimbatore
		2.	*Pura Varagu*	Farmer, Jawadhu Hills
				Sahaja Samrudha, Karnataka

* GPU 28 is an improved millet variety released by the University of Agricultural Science, Bangalore and is a popular variety cultivated by the farmers in Karnataka.

The germination results were observed and the seed varieties were categorised based on the germination and morphological characteristics (rooting and shooting) observed visually (Table 3).

Table 3 : Millet Varieties Grouped by Visual Observation of Germination Efficiency

Sl. No.	Species and Variety Germination	Germination
1.	Barnyard Millet – CO2	Excellent – Seed germination was around 90-100% and good development of roots and shoots observed
2.	Barnyard Millet - RMD 1	
3.	Barnyard Millet	
4.	Finger Millet - *Mutta Kelvaragu*	
5.	Finger Millet - *Bili Munduga*	
6.	Finger Millet - *Bonda*	
7.	Finger Millet - CO14	
8.	Finger Millet - *Jagaluru*	
9.	Finger Millet - *Malali*	
10.	Finger Millet - *Nagamala*	
11.	Finger Millet - *Pichakaddi*	
12.	Foxtail Millet – CO7	
13.	Foxtail Millet - Gross variety	
14.	Foxtail Millet - Mabbu variety	
15.	Foxtail Millet - Tree variety	
16.	Foxtail Millet - White variety	
17.	Little Millet - CO4 *Samai*	
18.	Little Millet - IR 20	
19.	Little Millet - IR 8	
20.	Little Millet - *Sitten Samai*	
21.	Little Millet - SS	
22.	Little Millet – *Vella Samai*	

23.	Finger Millet - GPU – 28	Good – Seed germination was around 70-90% and the seeds that germinated showed good development of roots and shoots
24.	Foxtail Millet –Traditional variety	
25.	Foxtail Millet - *Yadiyuru*	
26.	Kodo Millet – CO3	
27.	Kodo Millet – *Pura varagu*	
28.	Proso Millet - CO5	
29.	Proso Millet –Traditional variety	
30.	Proso Millet – RMD 1	
31.	Proso Millet	
32.	Kodo Millet	No germination observed

Except for Kodo Millet all the seed varieties showed 70-100% germination and were taken up for seed multiplication in the farmers field.

3. Demonstration – Millet Cultivation

During Kharif 2012, a comparative demonstration of different little millets and varieties that were procured during May-June 2012, were taken up demonstration in the farmers field in four hamlets of the project area. In each of these demonstrations the millet varieties were planted adjacent to each other in the same plot separated from each other by a row of sun hemp. For this purpose, an agreement was signed with the farmer, who would provide the land required for the demonstration and maintain the crop as per the recommended practices. It was also agreed that the total seed harvested from this demonstration would be procured by the project from the farmer at the prevalent market rate plus with an additional Rs. 5 per kg.

The details of the crops cultivated, yield are given in Table 4.

Table 4 : Details of the Millet Varieties Cultivated in the Demonstration Field and Yield Obtained

S. No.	Village name	Farmer name	Crop	Variety	Area under culti-vation (acre)	Date of Sowing	Date of Harvest	Grains Harvested (kg)	Seeds Procured (kg)
1.	Seramarathur	Govindasamy, S/o Nadupaian	Little Millet	CO4	0.24	29.07.12	28.10.2012	5	0
				Sitten Saamai				5	0
				Vella Saamai				4	4
				IR 8				3.5	3.5
				IR 20				8	8
2.	Seramarathur	Appavu, S/o Chinnapaian	Proso Millet	CO5	0.158	10.08.12	19.10.2012	21	21
3.	Keezhjimarathur	Durai, S/o Kovari	Finger Millet	Mutta Kelveragu	0.405	19.08.12			
				GPU 28					
				CO14					
				Malali					
				Nagamala					
				Bili Munduga					
				Jagaluru					
				Pichakaddi					
				Bonda					

4.	Perunkatur	Karthikeyan, S/o Sadayan	Barnyard Millet	CO2	0.16	10.08.12	09.11.2012	3.5	3.5
				SS 1				No yield	No yield
				RMD 1				3	3
5.	Seramarathur	Vellaiyan S/o Arunachalam	Foxtail Millet	Traditional	0.356	29.07.12	04.11.2012	24	24
				CO7			05.11.2012	20	20
				Yadiyuru			06.11.2012	22	22
				White Fox Tail			7.11.2012	28	28
				Gross Fox Tail			08.11.2012	18	18
				Mabbu Fox Tail			09.11.2012	20	20
				Tree Fox Tail			10.11.2012	18	18
6.	Kumbalamarathur	Kamalahasan, S/o Lakshmanan	Foxtail Millet	Traditional	0.235	19.08.12	12.11.2012	2	2
				CO7				3	3
				Yadiyuru				2.5	2.5
				White foxtail				2	2
				Gross foxtail				3	3
				Mabbu foxtail				5	5
				Tree foxtail				1.5	1.5
				TOTA\L	**1.554**			**212**	**212**

The learning's from these trials were as follows:

- As the area under each variety were small, it affected the total quantity for each variety available for future multiplication and trials.
- One farmer who participated in the demonstration of Foxtail millet in Seramarathur has requested for White Foxtail millet seeds for the next season cultivation.
- Low yield was observed in many demonstration fields mainly due to the following reasons:
    1. The land provided by the farmers were not the ones initially agreed upon. Farmers were unwilling to commit their productive land for trials.
    2. Farmers were unable to apply recommended quantity of organic inputs (FYM) due to non-availability of the same.
    3. Delay in rains after sowing affected seed germination in many plots by line sowing methodology. We can design the trial with low seed quantity but appropriate equipments for rainfed agriculture need to be identified/designed.

Follow up Action Required

- Regular and close monitoring has to be done.
- Enough quantity of organic inputs need to be provided.
- Special care should be taken to avoid mixing up of varieties during harvesting.
- Need to withhold the buffer seeds in case of failure in germination due to lack of soil moisture.

4. Front Line Demonstration – CO4 *Samai* Variety

Front Line Demonstration (FLD) is an effective mechanism in demonstrating newly released crops, production/protection technologies and management practices in the farmers' field. It also provides a direct interface between researcher and farmers. Under the All India Coordinated Small Millets Improvement Project (AICSMIP), Department of Millets, TNAU has been conducting FLDs for various millet crops in Tamil Nadu. CIKS partnered with TNAU for coordinating and monitoring the FLD programme on little millets CO4 *Samai* variety in Jawadhu hills project area during Kharif 2012 (June – October). CO4 *Samai* is one of the improved little millet varieties released by TNAU. The objective of this demonstration was to familiarize the farmers with CO4 *Samai* (little millets), recommended management practices and comparing yield performance.

The guidelines provided by TNAU for conducting the FLD were as follows:

- The site of demonstrations should be at a place easily accessible and at a central point to attract large number of audience/farmers for impact, monitoring and feedback.
- The technology selected for demonstration should address the issue forced by farmers and be adaptable by the farmers.
- To create better and visible impact of a technology the demonstrations may be conducted in a cluster approach of at least 10 hectares (24 acres). One demonstration at an individual farmers field should never be less than 0.4 hectare and not exceeding one hectare.
- Other equal size plots of the demonstrating farmers or the equal size plot of neighboring farmers in the same farming situation may be considered as check or control plots for objective comparison of the results.
- Selection of the site should be decided in consultation with the Department of Agriculture and should be such that it is easily accessible to farmers of neighboring villages and extension workers coming from different parts of the district.
- The participating farmers should be progressive with leadership quality and easily approachable by other farmers and extension workers.
- Identification of FLD beneficiaries shall be carried out by the implementing Centre as per the requirement/aptitude of the farmers to conduct the demonstrations.

The standard TNAU guidelines/technology package recommendation for CO4 *Samai* variety is given in Table 5.

Table 5 : TNAU's Technology Package for Little Millet - CO4 *Samai* Variety

Input	
Seed	10 kg / ha – Line sowing 12.5 kg / ha – Gorru or seed drill sowing 15 kg / ha – Broadcasting
Single super phosphate	125 kg / ha
Urea	88 kg / ha
Muriate of potash	33 kg / ha
Carbendazim	2 gm / kg of seed
Biofungicides	*Pseudomonas fluorescence* 100 – 150 gm *Trichoderma viride* 40 – 60 gm
Biofertiliser	*Azophos* 40 gm / kg of seed (or) *Azospirillum* 600 gm + *Phosphobacteria* 600 gm per ha
Herbicide	Pendimethalin 2.5kg/ha
Technology / layout	
Date of sowing	As a rainfed crop sowing can be done in June-July
Spacing	25 x 10 cm
Seed treatment	Soak the seeds in 1 percent potassium chloride solution for 6 hours and dry the seeds under shade for 5 hours. To control seed borne diseases treat the seeds with carbendazium @ 2 g per kg of seeds (or) *Psuedomonas fluorescence* @ 10 gm/ kg of seeds. Treat the seeds with *Azospirillum*. @ 600 gm/ha and *phosphobacteria* @ 600 gm/ha (or) *Azophos* @ 40 gm/kg of seeds.
Fertilizer application	Apply 12.5 tonnes of FYM/ ha at the time of last ploughing. Recommended dose of fertilizer is 40:20: 20 NPK kg/ha. Entire dose of super phosphate and Muriate of potash should be applied at the time of sowing. 50% of urea should be applied at the time of sowing and remaining 50% urea should be applied in two equal splits at 25-30 and 40- 45 days after sowing
Weeding	Two hand weedings at 20 and 45 days after sowing (or) inter cultivation at 20 and 45 days after sowing.
Irrigation (if available)	Using mobile sprinkler at critical stages of crop growth viz., tillering and flowing
Plant protection measures	Pests - Shoot fly is the most serious pest causing significant yield losses. Control measures to be followed are: 1) Early sowing with the onset of monsoon is an effective and cheapest method of control 2) Higher seed rate to maintain the plant population 3) Trapping of adults through fish meal trap @ 5 nos/ac 4) Seed pelleting with chlorpyriphos @ 4 ml / kg of seed

Disease and pest management	Diseases - There are no serious diseases on the crop
Harvest	After proper drying and maturity of earheads, harvest should be done.

Aatiyanur hamlet was selected to conduct the FLDs, from a short list of three hamlets by TNAU scientists. Thereafter, 13 farmers fields were selected based on the farmers willingness and suitability of the land for conducting the demonstration as per AICSMIP/TNAU guidelines. The experimental design planed was to cultivate in each farmer field 0.40 ha of CO4 *Samai* as per the recommended practices and in the adjacent 0.40 ha field the farmers variety as per the farmer's practices.

However, as the programme proceeded, the actual land area made available by the farmers for demonstration decreased. Instead of farmers setting aside 0.80 ha (0.40 each for CO4 *Samai* and *Sitten samai)*, they could only provide between 0.17 to 0.38 ha for the cultivation of CO4 *Samai*. Initially, the farmers showed the land area with field bund with measurement stands in the said range. However, they were not ready to extend the area as they needed to resize their land by forming new field bunds. As no separate plot was marked as control plot, data from the adjacent fields in which the farmer had cultivated *Sitten Samai* was used for comparison. Table 6, shows the proposed and actual area under FLD.

Table 6 : Total area under FLD programme during Kharif 2012

Particulars	Proposed area (ha)	Cultivated area (ha)
CO4 *Samai*	5.20	3.32
Sitten Samai	5.20	5.20
Total	**10.40**	**8.52**

The farmers participating in this programme were provided CO4 *Samai* variety seeds along with organic inputs such as vermicompost, neem cake and biofertilizers (*Azospirillum* and *Phosphobacteria*). Organic inputs were substituted for the chemical fertilizers. However, the quantity of inputs provided were limited by the funds available under the FLD programme. Though the farmers were informed to use additional FYM, many farmers did not do so. Technical guidance was provided by TNAU staff. Regular field observations were also made and recorded during the demonstration/trails as per the guidance of TNAU. The farmers followed their traditional practices of management. The salient features of the differences between the FLD and farmers practices is captured in Table-7. The recommendations followed in here is a modified version of the practice suggested by TNAU as organic inputs were provided/ suggested and used.

Table 7 : Major Difference in Recommended (Modified to Suit Organic Farming Practices) and Farmers' Practice in Little Millet Cultivation

Details	Recommended Practice	Farmers Practice
Sowing	Line sowing	Broad casting
Seed rate	5 kg/acre	25 – 30 kg/ acre
Vermicompost	50 kg/acre	Fertilizing by penning and/or chemical fertilizer.
Neem cake	50 kg/acre	
Azospirillum	2 kg/acre	
Phospho-bacteria	2 kg/acre	

The inputs were supplied by CIKS to all the 13 farmers as per FLD terms in the month of July 2012. CIKS field team coordinated the complete programme with seed supply, inputs distribution, periodical observation, data collection and monitoring. Of the 13 farmers who participated in this programme, three farmers were not able to continue.

The table 8 lists the names of the farmers who had participated in the FLD programme, the area cultivated as per the recommended practice with CO4 *Samai* variety and the area under farmers practice. All the farmers cultivated *Sitten Samai*, which is a popular traditional variety, widely cultivated in Jawadhu hills. The yield of CO4 *Samai* alone is provided in this Table.

Table 8 : List of Farmers Selected for FLD Trials

S. No.	Name of the Farmer	Total Area (ha)		Yield CO4 *Samai* variety (kg/ha)
		Recommended Practices	Farmer's Practices	
1.	Harimoorthi G S/o Govindan	0.38	0.40	395
2.	Krishna Moorthi KG S/o Govindan	0.17	0.40	-
3.	Krishnan R S/o Rangasami	0.30	0.40	1,000
4.	Raman C S/o Chinna perumal	0.28	0.40	179
5.	Ramasami G S/o Govindan	0.22	0.40	455
6.	Thirupathi G S/o Govindan	0.27	0.40	222
7.	Thirupathi G S/o Govindan	0.19	0.40	1,368
8.	Thirupathi L S/o Lakshmanan	0.22	0.40	500
9.	Thiruvenkadam G S/o Govindan	0.19	0.40	-
10.	Unnamalai K, W/o Kaali	0.28	0.40	1,286
11.	Venkatesan G, S/o Govindan	0.36	0.40	444
12.	Venkatesan R, S/o Ramasami	0.32	0.40	406
13.	Vijayakumar G S/o Govindan	0.11	0.40	-
	Total	**3.32**	**5.20**	**6,255**

As monitoring the fields under farmers practice was difficult, three farmers field were selected as control and for monitoring purpose. The comparative data are provided in Table 9.

Table 9 : Yield Comparison between Recommended and Farmer's Practice

S. No.	Name of the Farmer	Yield (kg/ha)	
		CO4 *Samai*	***Sitten Samai***
1.	Thirupathi G S/o Govindan	1,368	520
2.	Thirupathi L S/o Lakshmanan	500	600
3.	Unnamalai K W/o Kaali	1,286	640

On an average 46% increase in yield could be observed in recommended practice when compared with the farmer's practice. Low yield in one of the farmer's field (Thirupathi. L) is due to low germination. This is in turn attributed to low soil moisture caused by long gap in rainfall after sowing with the initial rainfall and subsequent rainfalls. This could have been avoided had the farmer re-sowed his field as practiced in traditional cultivation practice.

The constraints identified during this programme were as follows:

- Farmers are unable to provide or set aside land area such as 0.4 ha exclusively for experimental purpose, due to their limited land holding size.
- As the sowing season approaches and depending upon the rainfall, the farmers reallocate the plot for conducting the trials.
- Farmers were not familiar with line sowing method and found it difficult to adopt. Of the 13 farmers only 5 undertook line sowing method.
- Delay in subsequent rains after sowing, affects soil moisture, thereby affecting germination as well drying of seedlings.
- Rains during harvesting/threshing can effect field operations and lead to yield loss
- Field management practices have to be addressed to each field individually as the topology and soil conditions vary from field to field, which in turn affects yield.
- An integrated approach needs to be developed and adopted for better yield and soil health. Though the seed rate was reduced, it did not effect the yield, actually an increase in yield was observed when compared to traditional practices. However, it was observed that the incidence of weed increased. The use of compost in the field or penning methodology will avoid weed occurrence.
- Use of micro irrigation techniques such as sprinkler irrigation during critical stage of growth will protect the crop from yield loss.

Through these FLD trials, it was demonstrated that the seed rate could be reduced by 20% and farmer will be able to get better yields than the traditional practices. However, farmers find it difficult to undertake line sowing and controlling the seed flow rate through the seed driller equipment. Higher weed incidence were also observed in line sowed fields than the fields where seeds were broadcasted. As these trials were for demonstrating the CO4 *Samai* variety and recommended practices and were not designed for comparative performance between CO4 *Samai* and *Sitten Samai*, future demonstrations could be conducted by cultivating both these varieties under identical management practices in selected farmer's field as participatory research and development activities. Such activities would help in demonstrating other technologies for soil moisture conservation, which was identified as one of the major limiting factor in ensuring seed germination and subsequent growth.

Future activities proposed include demonstrating and documenting difference in broadcasting and transplanting method in cultivation in millets for the promotion of millets in plains as nutrient rich crops.

5. Seed Multiplication - Millets

During June 2012, millet seed varieties were obtained from various sources and were tested for

Table 10 : List of Farmers and Details of Crops Cultivated, Acreage, Yield and Seed Procurement

S. No.	Name of the Farmers	Village	Crop	Variety	Cultivated Area (acres)	Consolidated Area (acres)	Date of sowing	Date of Harvest	Seeds Harvested (kg)	Yield (kg/ acre)	Seeds Procured (kg)
1.	Unnamalai W/o Kali	Aatiyanur	Little millet	CO4	0.69	2.07	19.07.12	15.10.2012	400	580	322
2.	Chinnaraj S/o Ramasamy	Keezhjimarathur			0.31		20.07.12	09.10.2012	130	419	105
3.	Venkatesan S/o Govindasamy	Perunkattur			0.73		28.07.12	27.10.2012	300	411	206
4.	Appavu S/o Chinnapaian	Seramarathur			0.19		02.08.12	04.10.2012	60	316	51
5.	Govindan S/o Ponnusamy	Borenelli-marathur			0.15		05.08.12	07.11.2012	53	353	53
6.	Azhagesan S/o Ponnusamy	Jambadi		*Sitten Saamai*	0.40	2.02	17.08.12	19.11.2012	250	625	217
7.	Vellachi D/o Ramasamy	Keezhjimarathur			0.31		19.07.12	13.10.2012	276	890	216
8.	Chandarsekar S/o Periapaian	Jambadi			0.50		22.07.12	21.10.2012	300	600	200
9.	Kuppusamy S/o Ponnusamy	Seramarathur			0.41		23.07.12	19.10.2012	250	610	208
10.	Durai S/o Chinnaian	Meljimarathur			0.40		24.07.12	10.10.2012	350	875	296
11.	Unnamalai W/o Kali	Attiyanur		*Vella Saamai*	0.36	0.66	19.07.12	26.12.2012	130	361	116
12.	Kamalahasan S/o Lakshmanan	Kumpalamarathur			0.30		20.08.12	01.12.2012	120	400	91

S. No.	Name of the Farmers	Village	Crop	Variety	Cultivated Area (acres)	Consolidated Area (acres)	Date of sowing	Date of Harvest	Seeds Harvested (kg)	Yield (kg/ acre)	Seeds Procured (kg)
13.	Kuppusamy S/o Perumal	Borenellimarathur		IR 8	0.43	0.67	17.08.12	16.11.2012	300	698	0
14.	Murugan S/o kullu	Meljimarathur			0.24		24.07.12	26.10.2012	49	204	36
15.	Balaraman S/o Gopal	Keezhjimarathur		IR 20	0.73	1.24	22.07.12	NA	NA	NA	0
16.	Karthi S/o Chinnraj	Keezhjimarathur			0.22		23.07.12	09.10.2012	221	1,005	198
17.	Kulanthai S/o Arunachalam	Kumpalamarathur			0.29		10.08.12	NA	NA	NA	0
18.	Kuppusamy S/o Ponnusamy	Seramarathur	Proso Millet	CO 5	0.11	0.34	28.07.12	02.10.2012	60	545	40
19.	Harichandran S/o Kuppusamy	Mullipattu			0.23		03.08.12	20.10.2012	17	74	14
20.	Muthan S/o Periapaian	Jambadi	Finger Millet	*Mutta Kelveragu*	0.17	0.63	30.07.12	28.10.2012	35	206	28
21.	Kuppusamy S/o Thirupathi	Perunkattur		CO 14	0.24		17.08.12	16.11.2012	20	83	5
22.	Govindan S/o Ramasamy	Kumpalamarathur		GPU 28	0.23		20.08.12	17.10.2012	13	57	7.5
23.	Boochi S/o Chinnapaian	Jambadi	Foxtail	CO 7	0.28	0.28	17.08.12	19.11.2012	5	18	0
TOTAL					**7.91**	**7.91**			**3,339**	**9,330**	**2,409.50**

their germination efficiency. For multiplication of these seeds, 23 farmers were selected for undertaking seed multiplication during *Kharif* 2012. The selection of the farmers were based on their willingness to participate, having land that is protected from animals and the land accessibility from road. Efforts were also taken to undertake this activity in all the project villages.

The participating farmers in the seed multiplication activity were requested to give a written undertaking that they would undertake seed production as per the guidelines provided by CIKS. These farmers were also provided with necessary orientation and training. Table 10 provides the list of farmers and details of crop cultivated, acreage, yield and seed procurement.

Seed production was taken up in 23 farmers fields covering nine villages. Ten varieties of four millets were taken up for seed multiplication during Kharif 2012. On an average each farmer cultivated 0.33 acres for seed production. A total of 3,339 kg of grain yield was obtained from these farmers's field and of which 2,409.5 kg was procured from the farmers for use as seed materials during the Kharif 2013 season.

6. Agriculture Department - INSIMP Scheme

The Agriculture Department under its Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP) scheme supported 51 farmers covering 110 acres in the project area. Each of the participating farmer was provided mini kits. The two tables 11 and 12 lists the composition of inputs provided in the mini kits and the village wise break up of number of farmers benefited and area covered.

Table 11 : Composition of Inputs in the Mini Kits

S. No.	Materials	Quantity Recommended (kg/ha)	Quantity Recommended (kg/acre)	Total Quantity Received from Agriculture Department (kg)	Rate (Rs./kg)	Total Amount (Rs.)
1.	Seeds CO4 *(Samai)*	4	1.6	176	25.00	4,400.00
2.	Urea	40	16	1,760	6.40	11,264.00
3.	DAP	17	6.8	748	25.00	18,700.00
4.	Potash	25	10	1,100	17.00	18,700.00
5.	*Pseudomonas fluorescence*	4	1.6	176	70.00	12,320.00
6.	Biomix	4	1.6	176	90.00	15,840.00
TOTAL						**81,224.00**

Table 12 : Village Wise Breakup of Number of Farmers Participating and Total Area Covered

S. No.	Name of the Hamlet	Number of Farmer's	Total Area (acres)
1.	Borenellimarathur	9	16.4
2.	Jambadi	6	20.75
3.	Keljemarathur	7	4
4.	Kumbalamarathur	8	6
5.	Meljemarathur	7	0.75
6.	Mullipattu	6	13.25
7.	Seramarathur	8	23.5
TOTAL		**51**	**84.65**

TNAU - All India Coordinated Small Millets Promotion

The project availed inputs by way of collaboration with TNAU under the All India Coordinated Small Millets Promotion (AICSMP) programme benefiting 246 farmers covering 246 acres (Table 13).

Table 13 : Total Inputs Received and Distributed and Total Inputs Received in Terms of Monetary Value

S. No.	Materials	Mini Kit/ Acre/ Farmer includes (kg)	Received (kg)	Distributed		Balance (Kg)	Quantity (kg)	Rate (Rs.)	Amount (Rs.)
				Kg	No. of farmers				
1.	Seeds CO 4 *Samai*	4	736	736	184	-	736	25.00	18,400.00
2.	Micro Nutrient mixture	5	1450	1230	246	220	1450	60.00	87,000.00
3.	*Pseudomonas fluorescence*	500 gm	230	130	246	108	230	75.00	17,250.00
4.	*Azospirillium*	500 gm	190	130	246	60	190	40.00	7,600.00
5.	*Phospho-bacteria*	1 kg	302	246	246	56	302	40.00	12,080.00
TOTAL									**1,42,330.00**

7. Home Garden

The baseline survey showed that the awareness level on home garden and nutritional security was low among the respondents. To address this gap the project also took up the task of creating awareness and promoted household kitchen garden activities in the project area with an initial focus on nutritional security. Based on the general preference and suggestions by the farmers, vegetable seeds of 22 varieties, were procured from farmers (Komuteri and Melnellimarathur hamlets) and also from market (Tirupathur and Vellore) for household distribution in the project area. These seeds were repacked in small packets and distributed among 300 households in 13 villages.

These vegetables were cultivated in the backyards of individual households. In a few cases in the absence of adequate space they were cultivated in fields adjacent to water sources/ houses. In general, the plants showed good growth. However, some of the cases, due to lack of adequate watering and absence of rain affected the growth and yield. The survival rate ranged from 28 to 90%, with an average of 68% among these monitored households. The feedback received from the farmers shows that almost all of them benefitted through this programme and they have been using the vegetables for their own consumption and also selling the surplus. The value of harvested vegetables ranged from Rs. 230/- to Rs.1,710/- with an average of Rs. 552/- during the first trial.

According to customs in the area, farmers save seeds for their own use, which was reemphasized through the project and the option was also given for selling back the seeds to the project if there was surplus. The seeds selected for this purpose were, chilli, tomato, brinjal, bottle gourd, pumpkin, broad beans, bitter gourd, beans, drumstick, lady's finger, etc. Some farmers shared their chilli, bhendi and brinjal seeds for distribution during next season.

The project is also taking efforts for the collection of traditional vegetables seeds that are cultivated in the backyards. As of date, nine varieties have been collected and these include vegetables such as bitter gourd, broad bean, brinjal, chilli, pumpkin, ribbed gourd and tomato. The activity was initiated to create awareness on kitchen

gardening with good quality seeds. Though all the farmers (mostly men) were very enthusiastic for participating in this programme, the actual work was done by the women members.

8. Interaction with Forest and Horticulture Department

The Forest Department is one of the major stakeholder in the project area as about 75% of the total area in Jawadhu hills block comes under the Reserve Forest. The project has been actively interfacing with the Forest Department and the community for availing the schemes and support provided by the Department. The project created the necessary awareness among the community about the scheme and the tree saplings available from the Department. Based on the requirement of the community, an indent for 2,050 (1,500 teak and 550 silver oak) tree saplings was placed with the Department. On receiving the tree saplings, these were distributed to 383 farmers in 12 project hamlets. Each individual beneficiary was supplied five saplings in a 4:1 or 3:2 ratio of teak and silver oak. As a pre-condition for the supply of saplings, the farmers were requested to dig 5 pits of 2 x 2 feet in the field. The GPS reading of the area where the tree saplings were planted was also recorded for monitoring purpose.

CIKS undertook initiatives in channelizing available schemes to the farmers in the project villages with the support of Horticulture Department. 50 farmers benefited from facilities provided by the Department for soil testing under its Soil Testing Programme. The Department also provided Curry leaf saplings (100) free of cost which were distributed among the Farmer's Club members. The project is also interfacing with the Department and the community for availing the Integrated Horticulture Development Scheme provided by the Department.

D. DETAILED SITUATION ANALYSIS – SECOND ROUND OF WORK IN PROGRESS

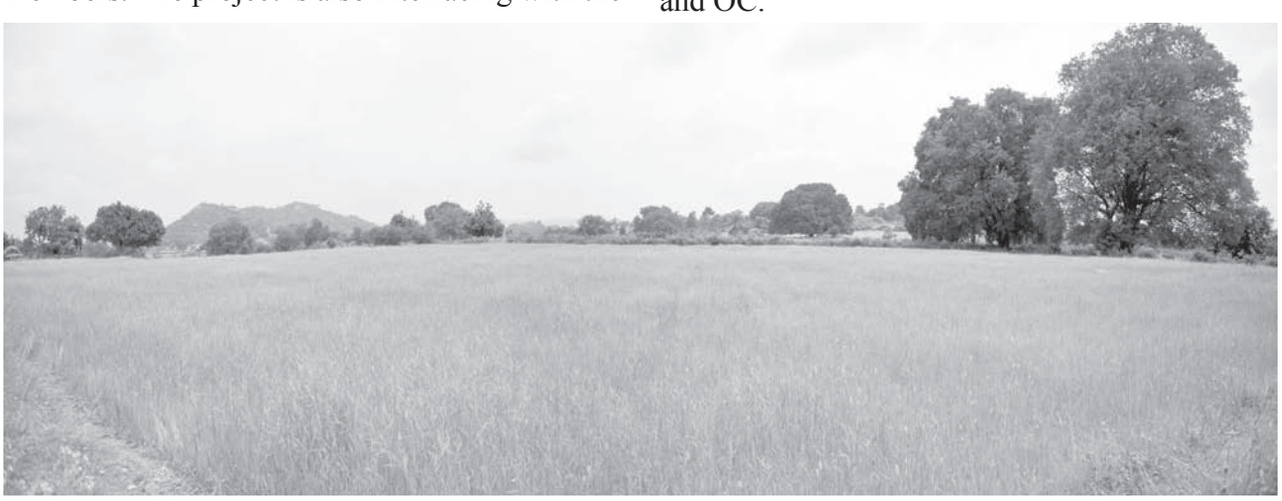
During the second round of situation analysis the work was more extensive and in depth. The study covered all the 265 hamlets in the block covering a population of about 51,000 persons comprising of slightly over 14,000 families.

Area Covered

The study covered all the eleven Gram Panchayats (GPs) in the block, ie., - Kovilur, Nammiyampattu, Veerapanur, Melsilambadi, Kuttakarai, Palamarathur, Oorkoundanur, Thenmalai Athipattu, Puliyur, Kallathur and Kanamalai.

For the sake of convenience in terms of interviews, data collection and sampling the eleven Gram Panchayats were divided into 28 clusters. These clusters are - Aatiyanur, Thombareddy, Athipattu, Jamunamarathur, Erimamarathur, Odamangalam, Mandaparai, Veerapanur, Pudur, Manjuthu, Melur, Melsilambadi, Kovilanur, Palamarathur, Oorkoundanur, Thenmalai Athipattu, Thalur, Kallathur, Puthur, Nammiyampattu, Paadanur, Chinnaveer pattu, Nadupattu, Vedakollai medu, Elanthampattu and Ponganur.

The accompanying table lists the clusters under each gram panchayat and provides details about the number of hamlets, households and the population under each cluster with the breakup of the population in terms of – SC, ST, MBC, BC and OC.



Break up of Jawadhu Hills Block Area into Clusters for Detailed Survey

Sl. No.	Gram Pancha-yat	Cluster	Hamlets (Nos.)	Total House Holds (Nos.)	Total Popu-lation	SC	ST	MBC	BC	OC
1.	Kovillur	1	11	417	1,395	-	1,395	-	-	-
		2	12	613	2,217	-	2,217	-	-	-
		3	12	726	2,759	107	2,652	-	-	-
		4	12	900	3,199	99	2,275	304	494	27
		5	13	790	2,780	212	2,236	36	288	8
Sub Total			**60**	**3,446**	**12,350**	**418**	**10,775**	**340**	**782**	**35**
2.	Veerapanur	6	9	359	1,506	-	1,506	-	-	-
		7	9	420	1,685	-	1,685	-	-	-
		8	9	816	3,139	42	3,097	-	-	-
Sub Total			**27**	**1,595**	**6,330**	**42**	**6,288**	**-**	**-**	**-**
3.	Kuttakarai	9	12	542	1,975	-	1,975	-	-	-
		10	6	324	1,321	-	1,321	-	-	-
Sub Total			**18**	**866**	**3,296**	**-**	**3,296**	**-**	**-**	**-**
4.	Melsilambadi	11	11	312	984	-	984	-	-	-
		12	13	606	1,791	60	1,731	-	-	-
Sub Total			**24**	**918**	**2,775**	**60**	**2,715**	**-**	**-**	**-**
5.	Palamarathur	13	8	359	1,395	-	1,395	-	-	-
		14	10	540	2,031	110	1,921	-	-	-
Sub Total			**18**	**899**	**3,426**	**110**	**3,316**	**-**	**-**	**-**
6.	Oorkoundanur	15	12	567	2,191	-	2,191	-	-	-
Sub Total			**12**	**567**	**2,191**	**-**	**2,191**	**-**	**-**	**-**
7.	Thenmalai Athipattu	16	4	326	1,273	-	1,273	-	-	-
Sub Total			**4**	**326**	**1,273**	**-**	**1,273**	**-**	**-**	**-**
8.	Puliyur	17	8	448	1,596	37	1,559	-	-	-
	Sub Total		8	448	1,596	37	1,559	-	-	-
9.	Kallathur	18	7	637	2,033	187	1,297	306	181	62
Sub Total			**7**	**637**	**2,033**	**187**	**1,297**	**306**	**181**	**62**
10.	Namiyampattu	19	10	279	962	-	962	-	-	-
		20	10	635	2,618	8	2,604	6	-	-
		21	18	757	2,495	8	2,487	-	-	-
		22	10	475	1,687	-	1,687	-	-	-
		23	7	348	1,144	-	1,144	-	-	-
Sub Total			**55**	**2,494**	**8,906**	**16**	**8,884**	**6**	**-**	**-**
11.	Kanamalai	24	10	512	2,002	-	1,929	5	68	-
		25	11	618	2,716	-	2,716	-	-	-
		26	11	749	2,768	-	2,768	-	-	-
Sub Total			**32**	**1,879**	**7,486**	**-**	**7,413**	**5**	**68**	**-**
GRAND TOTAL			**265**	**14,075**	**51,662**	**870**	**49,007**	**657**	**1,031**	**97**

Preliminary Results from the Analysis from one Cluster

The detailed situation analysis is currently in progress. However, we are sharing here the results from the preliminary analysis carried out in the first set of clusters located in the Kovilur gram panchayat. The study covered four clusters located in 34 hamlets.

Current Situation

The preliminary report is given in the form of a set of details collected about the current situation. This will followed by observations and analysis of gaps later.

Current Situation

- 98% of farmers produce their own seeds and save them for the next cropping season. 2% of farmers buy seeds from outside sources like Agriculture Department, shops from Polur, Vellore and Thiruvannamalai.
- Diversity of millets has been reduced compared to last year baseline survey data.
- Compared to last year the production of maize *(makka cholam)*, Ragi *(kezhvaragu)* and bajra (*cumbu*) has come down significantly.
- Seed usage rate per acre for millets is high. On an average 15- 20 kg/acre is used all over the Kovilur panchayat.
- Most varieties like *Thinai, Pura Varagu, Pani Varagu* and *Cumbu* are lost in this panchayat. (It was last sown approximately 5-10 years back)
- Farmers do not follow any special practice to identify the quality of seeds to be stored for next cropping.
- Cost of cultivation for *Sitten samai* / acre is app. Rs. 2500 – 3000/- in Kovilur panchayat.
- Farmers do not involve in commercial seed production with certification. They produce grains and market it. 5% of farmers are involved in grains marketing in Kovilur panchayat.
- There are 15-20 seed brokers/agents in Kovilur panchayat.
- Subsidy schemes, bank loans and insurance have not been taken by 98% of farmers in Kovilur panchayat.
- Markets for selling millets are not transparent. Farmers do not know who fixes the rate/kg. Current rates in 2013 October - Rs. 20/- and Nov - Rs. 19/-.
- Selling to agents/brokers is more convenient to farmers. There is no transportation cost. Even though the cost is less when compared to direct sale to shops they prefer agents to come to the door step.
- 90% of the farmers (Age below 40) do not have any clear idea in identifying seed varieties by its external characteristics such as size, color, texture.
- Average acreage under millet cultivation in Kovilur panchayat is 1-3acre/farmer.
- Farmers are of the view that this year, during this cropping season the rain was less compared to last year. Yield/acre on an average was 300 – 400 kg. (Usually 600 – 800 kg will be the yield in an acre).
- Value addition is not done for millets. Grains are directly sold.
- Millet consumption for this year has declined to 96% from last year baseline data.
- Kitchen garden practices are very less in Kovilur panchayat. Out of 37 households only 8 houses have kitchen gardens.

Observations and Gap Identification

- Farmers prefer *Sitten samai* for its short duration and success rate in production.
- They do not prefer the improved varieties. A few varieties like CO4 have been tried last year but the success rate was low. Germination failure, less yield, high manure supply and lodging in rain are the problems listed.
- Due to less rain and delay in season most of the varieties have not been cultivated or cultivated in very less area this year.
- Lack of knowledge about right amount of seed usage. They use more seeds for sowing, to take care of germination failure.

- Change in cropping pattern, season and based on market value few varieties are not under cultivation practices.
- Lack of necessary training programmes and exposure visits in seed sector.
- Most of the farmers in this panchayat use manure like urea for growth and tractor for ploughing instead of traditional practices. (Usage of tractor/hr is Rs. 500/-)
- No machines/processing units are available for millets.
- Free distribution of millet seeds for 2012 cropping season from the Department of Agriculture was not availed by most of the farmers and it was also supplied late after cropping season.
- The marketing of millets depends completely on the local network of agents/brokers. There are no direct linkages between the farmers and the buyers.
- Agents/brokers mostly come to door step and collect the grains for Rs. 1 or 2/- less than market value.
- There is lack of traditional farming practices, knowledge, interest and awareness in millet diversity.
- No facility has been constructed by the government for millet value addition.
- Cleaning and milling of millet is not being done by women nowadays by hand.
- People in Jawadhu produce millets and sell them in the market. They do not store them for food. They prefer to eat ration rice over millet.
- Lack of space, inadequate water facility is also a reason for not maintaining kitchen gardens.

Other Crops and their Presence

The growth of other crops in Kovilur panchayat is summed up in the following table.

S. No	Name of the crop	Area of coverage in percentage
1.	Paddy white ponni	16%
2.	Paddy Deluxe ponni	14%
3.	Paddy *Maduvu Muzhungi*	8%
4.	Horse gram	10%
5.	Sesame – Niger	11%
6.	Ragi - *Perunkezhvaragu*	3%
7.	Ragi – *Muttaikezhvaragu*	8%
8.	Bajra – *Cumbu*	2%
9.	Little millet – *Sitten samai*	24%
10.	Samai – IR 20	19%
11.	Maize	5%
12.	Fruits	10%
13.	Vegetables	5%

Focussed Group Discussion

The farmers from the following 11 villages among four clusters in Kovilur panchayat participated in a focused group discussion in November 2013 at CIKS Jamunamarathur office. (Melnellimarathur, Aatiyanur, Meljimarathur, Aalanjanur, Kumbalamarathur, Seramarathur, Melathipattu, Kezhpalankottai, Perunkaattur, Gundalathur and Thombareddy). Following is a summary of the points discussed.

- The list of traditional millet seeds *(Pura Varagu, Kaurnsamai, Kuthuraivali* and *Koluthanar)* cultivated earlier were collected.
- The change of cropping pattern due to changes in rainfall pattern in recent years was discussed in detail.
- The farmers are willing to grow their millets organically with proper training and exposure in organic traditional practices.

- They were explained about improved varieties and the techniques to use less seeds for sowing and increasing the yield.
- Traditional storage methods (Bamboo drums, *Dommai's*, mud pots) were used by farmers and they were able to store 2.5 tonnes one time.
- Cleaning, processing and value addition techniques during old times were discussed and modern methodologies were also explained to them.
- Seed conservation methods and traditional seed conservation methods were discussed.
- The importance of livestock sector and strengthening of the livestock was explained and the details of loan and insurance availability were briefed.
- Market sources and the linkages along with an approximate data of how much transaction is done per year in Jawadhu hills were captured. There are about 20 agents in Kovilur panchayat itself (150 tonnes millets/agent/ year is the estimated transaction value).
- On an average every year 20,000 tonnes millets is being procured from Jawadhu hills by outside sources.
- Seed certification and seed production process and marketing was explained in detail.

CHAPTER IV : TOWARDS A ROBUST SEED SYSTEM

As we had emphasized in the introductory chapter this is a continuously emerging effort. In the third chapter we had outlined the initial situation analysis and baseline survey, the first set of actions and interventions and this was then followed by a report on the detailed situation analysis which is still in progress. In this section we summarize our overall approach giving an overview of two aspects namely – the planning of the seed management system and our experiences as well as plans with respect to the institutional framework.

We are summing up the material in two broad sub-sections as follows.

A. Community Seed Systems – Area based approach and planning and

B. Farmers Institutions – Our experience and proposed model

A. COMMUNITY SEED SYSTEMS : AREA BASED APPROACH AND PLANNING

We wish to described herein activities under four broad categories i.e., area based approach, seed production making use of subsidies and Government schemes, seed certification based on PGS procedure and the production of paddy seeds using the SRI system.

1. Area based Approach for Planning the Seed Supply

Activities to be undertaken for area based planning of the seed supply are the following

a. Survey of the seeds currently available and being used by the farmers in that area and mapping in each case the - variety, source and other details.

b. Compilation of literature regarding land races available in that area covering – currently available land races, land races that were available in the past and which still survive in the memory of the farmers in that area, land races of which records can be traced through Agricultural Department documents, folklore literature or gazetteers and other sources.

c. Listing of all the varieties of seeds released during the last twenty five years which were made available to farmers in the block.

d. Assessment of the performance of the seeds in that area based on various criteria including farmers requirements.

e. An assessment of the needs of the area in terms of seeds articulating farmers requirements.

f. A plan of work in terms of how the seeds that are required by the farmers may be made available taking into consideration all the above data. The plan will spell out roles that can be played at various levels including

   i. Village level activities – seeds saved by farmers and seeds preserved by farmers who are trained as seed savers.

   ii. Seeds to be produced by community based organizations which may be – Self Help Groups, Farmers Associations, Producer Company etc.

   iii. Government sources and coordination with them and

   iv. Private seed industry

g. Identification of needs based on the above assessment in terms of requirements for field trials and research which may result in –

   i. Trial plots to be laid out in the area for observation of performance of seeds with farmers being participants in the design of experiments and involve researchers / Agricultural Department staff.

   ii. Possible experiments relating to participatory plant breeding.

h. Identification of topics on which training and capacity building needs to be given to – farmers, farmers trained as special seed

savers, sangam leaders, technical staff of sangams, CIKS and other NGOs on both technical and non technical matters and identifying resource persons and workplans for it.

2. Seed Production – Linkages with Government Schemes

The two main aspects to be kept in mind are the utilization of Government subsidies through various schemes.

a. Subsidies

Currently, the entire system of seed production that takes place formally is regulated by the Government through a requirement for – certification of seeds or suitable labeling as Truthfully labeled before it is marketed. This covers all categories of seeds except those that are saved by farmers and sold for exchange locally without a brand name. The Government has come out with provisions for support and subsidy for seed production. The desk study will be undertaken to look at – forms of subsidy, unit of operations for which subsidy is eligible and available and the persons who are availing subsidy, the practical experience with availing subsidy – interview and feedback with individual farmers, farmers groups and interviews with government officials involved in administering the subsidy programmes. Based on the above a workplan will be evolved about how the subsidy can be utilized towards a seed supply system in the block.

b. Government Schemes which would be Leveraged

There are a number of Government schemes which are available for seeds. Some of them are listed below.

- Seed multiplication scheme of paddy, millets, pulses and oilseeds.
- Cereals Development Programme – Macro management mode schemes (Under this distribution of paddy seeds).
- Enterprises for TANWABE women (seed production).
- ISOPOM scheme for pulses and oilseeds.
- National food security mission pulses scheme.
- ATMA scheme for training and demonstration.
- Schemes under Seed Certification Department.

Besides this various other schemes specific for the tribal development, hill area development will be explored and utilized.

3. Experimental Programme for Participatory Guarantee System (PGS) based Seed Certification

Currently seeds that are marketed are seeds that are certified through a process of registration with the Seed Certification Department and compliant with their procedures. The purpose of this programme is to try out an experimental procedure by which in a given area all the requirements of seed certification can be met through the collective efforts of a defined group of farmers (linked to a legal entity which may be a farmers society or an NGO) along the lines in which a product is guaranteed as organic through the PGS (Participatory Guarantee System). This will be tried out as a pilot in the selected area with the PGS system being undertaken by the farmers and technical support being provided by CIKS. In an identified area of land seeds will be produced with records and authentication as per the PGS like procedure. At the end of the crop season, the harvested seeds will be sold in a TFL (Truthfully labeled) seed labeling.

Expected Results

- A seed supply system for the block where at least 50% of the seeds that are preferred and

useful for farmers are produced by farmers utilizing Government support schemes.

- A supply scheme which takes into account high volume, low value seeds also.
- Increase in productivity shown through use of better quality seeds. (Productivity increase at least by 20% in 50% of the lands)
- Enterprises around seed production being taken up by farmers.

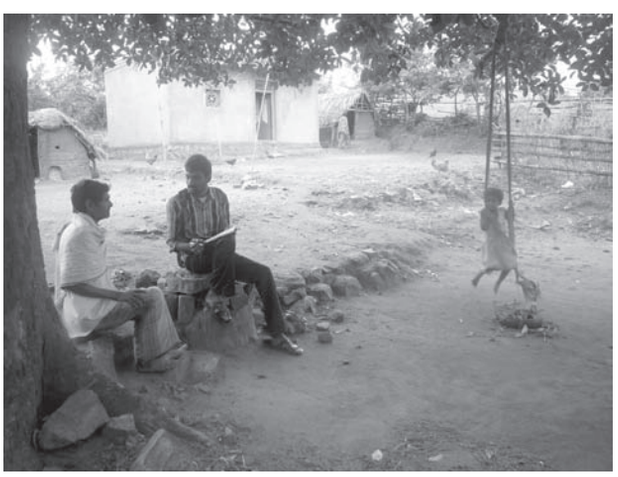
4. Production of Paddy Seeds using SRI

Paddy is cultivated in 945 hectares in this block. Of this, nearly 753 hectares is under irrigated condition. Much of the paddy cultivated is under well irrigation and has a significant impact on ground water. Though the State is promoting SRI on a large scale the percentage of farmers adopting SRI is less than 1% in this block. This is based on participatory meeting with farmers.

CIKS has been promoting SRI for rice cultivation with different rice varieties under different conditions for the last six years. We have also been involved in seed production using SRI for a wide range of varieties. We have been training large number of farmer groups across the country on SRI. Besides this in project areas we have the experience of leveraging SRI programmes of the Tamil Nadu Government with seed production of paddy and regular cultivation.

Proposed Intervention Strategies

- Promotion of SRI to 80% of paddy lands in the block by end of second year.



- This will be made possible by linking up with the Government of Tamil Nadu programme which supports SRI on a large scale.
- Promoting green manure seed distribution / cuttings of green manure plants for paddy growers by linking with specific schemes.
- Integrating seed production with SRI

B. FARMERS INSTITUTION: OUR EXPERIENCE

In terms of the types of farmers institutions the following are some of the models which we have worked with and familiar with –

a. SHGs of women farmers, men farmers and mixed groups

b. Organic farmer sangams – these are groups of farmers of small to large size (15 – 40 members) who are linked together by the common objective of organic farming. This may also be organized parallelly as SHGs.

c. Farmers clubs. These have been organized in Nagapattinam, Kancheepuram and Dindigul districts with programme support from NABARD.

d. Societies – Farmers' societies have been formed with support from CIKS in five different districts. They exist as registered societies in the districts of Nagapttinam, Chengalpet and Thiruvannamalai. Currently, the societies are functional but not yet registered in the districts of Dindigul and Ramnad.

e. Private Limited Company – CIKS provided technical support for the formation of a private limited company – Arogyam Organics Private Ltd., and supported it during its initial phase.

f. Producer companies. Currently CIKS has provided technical support and help for setting up of two different producer companies in Tamil Nadu. One of them is the Valanadu Sustainable Agriculture Producer Company Limited (VSAPCL) which is formed in the Nagapattinam district of Tamil Nadu. The other is the Marutham Sustainable Agriculture Producer Company Limited (MSAPCL) which has been formed

in the Thiruvannamalai district of Tamil Nadu. These have been formed based on our experience in working with farmers groups in both the districts and in collaboration with Vrutti Livelihood Resources Centre (VLRC) who are our project partners in this effort.

Institutional models being tested currently.

a. Limited Liability Groups (LLG)

We are in the process of constituting some such groups with support from NABARD in the Nagapattinam district of Tamilnadu

b. Multi State Cooperative Societies (MSCS)

The state of Tamil Nadu does not have a legislation in the nature of MSCS. However, it would be possible to register a multi state cooperative society under the Central Act if there are operations in more than one State. CIKS is planning to commence operations in future in Pondicherry – Pondicherry is currently a set of four disjointed geographical areas and one such area namely Karaikal region of Pondicherry is close to (in fact surrounded by) Nagapattinam district where we are very active. Hence we are considering the possibility of promoting the formation of a multi state cooperative society in future.

Experiences with Payments for Services

Farmers are willing to make payment for various inputs and services. Our experience shows that farmers are able to make contributions partly or fully for inputs and services and they are also able to make partial payments for acquiring assets and machineries. They have also contributed land, labour and material for collective endeavours.

In terms of our learning from the above, we shall sum it up as follows

- All our interventions can have impact at three levels
    1. Immediate and tangible – measurable in money terms the same crop season (Eg.) Rs.300/ pm from a home garden.
    2. Less tangible but felt soon (Eg) Improved soil fertility in the farm, better health.
    3. Long term – (Eg) improved environment
- HYPOTHESIS – Our assumption is that farmers will be willing and able to pay at least partly for materials or services which give them a Level 1 return.

Proposed Model

We feel that we can build upon this understanding and construct an enabling structure that is at three levels – village, cluster of villages and district levels as follows –

- Cadre of Village Agri-Business Service Providers (VABSP) who can offer a range of services tapping / linking with the State programmes / subsidies
- Cost structure by way of basic membership and service fees clearly defining the nature of services for each category
- Coordination with higher levels of organization – Village clusters, district level (as Producer Company), linkages with other district level structures etc.
- Various services – access to credit, subsidies, loans, insurance, grants, marketing, value addition etc., to be facilitated.

Based on the above experience we propose a strategy for intervention involving mobilization of farmers and the creation of institutions at three different levels as follows –

1. Farmer level – groups of farmers would be organized into SHGs, organic farming sangams and wherever possible we would also use the approach of forming them into farmers clubs in order to have activities supported by NABARD with which we have experience in other locations.
2. Village based Agri Business Development Service Providers (VABDSPs) – Our understanding is that while there are plenty of entitlements and benefits available to the farming community from the state the farmers are not able to utilize them due to a variety of constraints. The following is a list of constraints that we observed which may be taken as illustrative rather than exhaustive.
    - Lack of awareness about programmes.
    - Absence of or inability to procure specific supporting documents that are required to access the benefits (Eg., documentation regarding caste, tribal status etc).

- High transaction costs and time in terms of what is required to obtain information, submit a request or application and the follow up visits to access the benefits or services.
- Poor quality of services or materials provided (Eg., seeds with poor germination or vigour, biofertilisers that are ineffective because they are past their expiry date etc).
- Lack of organizational strength or linkages which limits the farmers capacity for collective bargaining or interfacing with the various departments.

Based on the past understanding we propose a creation of a cadre of personnel who we refer to as Village based Agri Business Development Service Providers (VABDSPs). They will be the key grass-root level service providers for the farmers under this project, and later they continue to operate under the Agri Service Facilitation Centre (ASFC) as members/ service providers. It is planned to have one VABDSP per village or cluster. They are expected to be one-stop service providers for all the farmers coming under the ASFC in that village. They will serve as a link between the farmers and the ASFC. They will help and enable the farmers to identify and articulate their problems and needs. They will also help the ASFC in coming up with inputs / solutions for the farmers needs in an intermediary manner.

The roles are-

- To undertake village level and house-to-house survey.
- To explore and identify appropriate profiles of farmers, who are linked to AFSC.
- To mobilise and form the farmers club/ SHGs, and village level bodies; facilitating documentation, conduct of meetings, training, etc.
- Facilitating selection and delivery of various services for the farmers, through the ASFC.
- Developing and supporting individual farmer level and farmer-groups to take up initiatives for improvement of incomes/ margins.
- Supporting in various studies and research.
- Facilitating entitlements and schemes for farmers groups.
- Monitoring performance of individual farmers and farmers' groups and providing them adequate training.
- Any other work that is required to be done from time to time.

To undertake this activity, a village based farmer will be selected, as they are more appropriate to provide services rather than external persons. These farmers who are VABDSP will be paid for performing the above roles, through the ASFC (once established). This will be based on a 'performance incentive system' in which each VABDSP will be given targets for completing their activities. Based on the completion of these activities the amount will be paid (variable component). A fixed component of fee will also be provided for basic services. The incentive planned for a VABDSP is Rs. 1,500/- per month. Of this amount, Rs. 750/- will be paid as a fixed component, and the balance Rs. 750/- based on the completion of the activities. The field manager will certify the completion of activities and recommend for payments at the start, and over a period of time, will be monitored and certified by the farmers' club. The amount of incentives to be paid to the service providers will increase over a period of time, as the number and extent of activities, and the number of farmers members are expected to increase. The incentives for the VABDSP will be paid initially in full by the project, and later from the support received from the farmers and farmer organisations.

Agri Service Facilitation Centres

The Agri Service Facilitation Centres (ASFCs) will perform the following functions

1. Provide inputs, primary services and basic training relating to the range of themes that are relevant and required for a farmer.
2. For somewhat more specialized services and training it would procure it from a specialized Agri Service Centre or refer the farmer to it.
3. It would be a channel of communication between village level and block level in the following manner.
    a. It would gather information and assess requirements of material, training and services on all aspects of agriculture.
    b. It would pool such information from all the villages in its work area and pass it on to the block level centre as an input for planning block level services centre to acquire the required inputs, training and material and also as a part of the planning process.

Functions of the ASFCs

We can divide this broadly into the category of – basic functions of each service centre and specialized functions of the service centre. While each service centre will perform all the basic functions it would also have specialized expertise or capacities in one or two chosen areas where it will provide special services that are not available in each service centre. An illustrative list is given below.

A. Basic Functions of the Service Centre

The following is an illustrative list of basic functions to be performed by each service centre that have been grouped as per the themes listed in Annexure - IV.

Supply of Material

1. Soil fertility – supply of vermicompost, farmyard manure, liquid manure, green manure seeds.
2. Seeds – Supply of seeds for the major basic crops of the area, seeds for intercrops, pooling of requirements by way of indents for seed varieties based on the requirements of the area, acquiring seeds for more specialized needs of the area from other service centres or sources, facility for safe storage of important and precious seed varieties from the area, information on various seeds available in the block, their characteristics and performances.
3. Millets – supply of millet seeds, millet processing facility at which millets may be processed or bartered, information on various millet seeds available in the block, their characteristics and performance.
4. Home herbal gardens – Seeds of vegetables and saplings of important medicinal plants required for home gardens, information on cultivation methods of vegetables, fruits and herbs that can be grown in the home gardens, information on the characteristics and cultivation methods of all these, kits for water conservation.

Training

Basic training programmes of non residential nature which may be of a duration of not more than one working day to be held on the following topics – (Illustrative list).

1. Composting procedures – farmyard manure, liquid manure, vermicomposting techniques, utilization of farmyard manure to conserve water and soil fertility such as contour bunding.
2. Crop protection – use of natural products, cultural practices.
3. Crop rotation.
4. SRI method of cultivation.
5. Home gardening – how to set up and cultivate a home garden, utilization of medicinal plants for home remedies, supplementary income generation through production of vegetable seeds.

B. Specialized Functions of the Service Centres

The following are specialized functions that may be performed by service centres that choose to specialize in some particular thematic area – a few illustrations are given –

Seeds

- Testing of seeds for purity, vigour and germination.
- Varietal testing for comparing the performance of different varieties.
- Demonstration plots where important local varieties of crops are grown.
- Demonstration plots of seed cultivation.
- Training on specialized areas relating to seeds such as – production of certified seeds, seed purification, varietal selection.
- Common facilities such as – seed processing unit.
- Field testing and standardization relating to storage of seeds.
- Information about and supply of seeds for repeat sowing, contingency crops.

Taking the Work Forward

In terms of advancing the work in the CP area we wish to conclude taking note of the fact that we have attempted a convergence with support that can be obtained from various other sources, both Government and Private. A few key initiatives are listed below.

A. FUNDING FROM OTHER SOURCES

1. NABARD Project under the Tribal Development Fund (TDF)

NABARD has sanctioned financial assistance for implementation of an integrated tribal development project titled 'Improving the Livelihood and Food Security of Small-Holder Tribal Communities through WADI Model and Integrated Sustainable Agricultural Practices in Jawadhu hills, Thiruvannamalai district, Tamil Nadu in 29 villages in Kovilur Gram Panchayat of Jawadhu hills block of Tamil Nadu. The project would be targeting the 1,000 households belonging to the small, marginal and the landless agricultural farmers from the Scheduled Tribe (ST) communities in 29 villages. The project aims to improve their livelihood and food security through an integrated WADI model along with horticultural and agriculture development, training and capacity building, women development and health, and establish/ strengthening community based institutions.

The expected outcomes of the project are summarised below.

- Increased and sustained income from 'WADI model': The current average annual household income is around Rs. 24,000/-. It is expected that the household income would increase by 75% from the current level, i.e. Rs, 42,000/- by the end of the fifth year. We expect, that increase in household income would be noticed from the second year onwards by way of savings on inputs and increased farm outputs. By the end of the fifth year, the fruit products from the WADI plantation would also be available for sale and value addition.
- Reduced migration and increased number of employment days in agriculture and allied activities.
- Improved productivity and reduced cost of cultivation for major crops through a package of practices – soil and water conservation, improved crop management practices, use of good quality seeds and other agricultural inputs.
- Increased returns from farm produce through value addition and market support services.
- Set up a satisfactory system for the supply of all seeds, saplings and planting material for this programme for – trees, crops, fodder etc.
- Diversified income from other agriculture allied sources – livestock and small ruminants, community managed social enterprises etc.

- Improved health status of tribal families through adoption of healthy food practices.
- A scalable community based institutional model will sustain the services and benefits.

2. Core Support Programme of the Department of Science and Technology (DST)

CIKS is recognized as an agency for receiving Core Support by the Department of Science and Technology of the Ministry of Science and Technology of the Government of India. The department has sanctioned support for a period of five years from April 2013 onwards for CIKS. During this five year period CIKS has in its proposal identified rainfed areas of Tamil Nadu as the focus for work identifying two specific locations one in Nagapattinam district and another in Jawadhu hills block in the Thiruvannamalai district. The initiatives that are being supported are –

- Production of seeds in the area
- Decentralised units for the production of inputs for sustainable agriculture
- Adaptive research to develop technologies for sustainable agriculture in the area on specific identified topics such as – weed control, crop protection etc.
- Building of farmers institutions for managing various of the above activities as well as interfacing with the market system and the Government.

B. LINKAGES AND NETWORKS WITH OTHER EFFORTS

Linkages are being established with other agencies who are involved in work in the same geographical location i.e., the Jawadhu hills block. Some of these agencies are

- DHAN Foundation – involved in activities relating to agriculture, livelihoods, etc., in and around the block
- Vellore Institute of Technology (VIT) which is a deemed University and has extension activities in the area.
- Don Bosco Tribal Research Institute has been active in this area for over 30 years and has set up village based institutions in many locations in the block.
- Srinivasan Services Trust is also active in many Gram Panchayats (GPs) in this block and we have been working together with them.

APPENDIX I : OVERVIEW OF DOCUMENTS

In this section we have provided an overview of documents that are normally produced and distributed by State Governments. However, we observed that there may be variations of different kinds between States along the following lines.

1. The document itself may be produced only in some States.
2. The document may be subject to variation from State to State in different ways such as – the exact format or sections and how quickly it is produced and available.
3. In terms of availability there may be variations in terms of documents being available in English, Hindi and other local languages as well as whether or not soft copies are available on the website.
4. The availability may be restricted in the case of some documents particularly to those that are produced only at the district or block / taluk levels.

The detailed descriptions in the following sections are drawn from the material produced in the Tamil Nadu State. In the case of other States we have added a small section in the later part of this booklet wherein we have provided an overview of the situation and the following States where programmes of RRA CPs are currently being carried out. These are the States of – Karnataka, Andhra Pradesh, Orissa, Jharkand, West Bengal, Madhya Pradesh, Gujarat and Rajasthan, besides Tamil Nadu State.

1. Season and Crop Reports

This report is produced once in every year by the Department of Economics and Statistics. The printed copies are available normally with the publications department of the Government but more recently soft copies are available in the website of the State Government or the State Agricultural University. We give below the bird's eye view of the contents.

The first part contains an overview of key factors such as – Rainfall, Land use pattern, Sources of irrigation, Area irrigated under different crops, Cropping pattern, Area, production and productivity, Agricultural wages and Wholesale price trend and each of these components there is an overview of the normal situation and the trends that have prevailed during the last few years. The terms are defined and discussed setting the background for the detailed tables that come in later.

The second part provides a State summary of certain key factors such as – classification of land, sources of irrigation and area irrigated, crop wise gross area under irrigation, production, yield as well as trends prevailing in the immediate few years.

The third part gives district wise details of rainfall land classification and sources of irrigation. The fourth and fifth parts provide break-ups and details at the district level.

The sixth and seventh parts provides economic details at the level of various wages and prices of commodities again at the district level.

The last three sections provide general background information usually at the level of the district about the peak sowing and harvesting season for various crops as well as the glossary of botanical English and Tamil names of crops.

This document is perhaps the basic starting point for information on various aspects of agricultural information and statistics.

2. District Statistical Hand Book

This is published by the Department of Economics and Statistics of the Government of Tamil Nadu. Here is an overview of contents.

1. Salient features of the districts – 2 page summary

2. Thiruvannamalai district profile – a table running to 8 pages providing an overview regarding area and population, vital statistics, temperature, rainfall, agriculture, irrigation, animal husbandry, dairy development, fisheries, forests etc.
3. 75 pages of tables giving details on each of the above factors. Generally, the information is at the overall district level. In some cases there is a break up given at the level of the blocks in the district (for example, with respect to irrigation, sericulture, dairy development etc.)

3. Block Statistical Hand Book

This is produced every year and available as a copy with block and district officials though not usually for sale. The following is an overview of the contents based on the recent block handbook for Jawadhu hills.

1. Map indicating the Gram Panchayat (GP)
2. A four page summary about the block, the key economic indicators and the population
3. A section on area and population with break up in terms of sex, literacy, village wise, SC/ ST workers
4. Temperature and rainfall given monthly and the list of locations of rain gauge stations.
5. Agriculture section including land utilization, area under crops, implements and machinery, operational land holdings, warehouses and godowns.
6. Irrigation break up in terms of sources and crops
7. Livestock population and veterinary hospitals and dispensaries
8. Poultry development and dairy development
9. Fishing equipment
10. Other sections dealing with electricity, communication, education, public health and civil supplies
11. Social welfare including nutritious meal programmes essential services rural development programmes and finances
12. Vital statistics in terms of birth, death and maternal deaths

4. "G" Return for the Block

1. Land classification and crop wise details with break up in terms of irrigated and un irrigated.
2. Source wise irrigation details

5. District Agricultural Plan Produced as Part of National Agricultural Development Plan (NADP)

This is available on the website of the Tamil Nadu Agricultural Universities (TNAU), Coimbatore. The following are the major sections

1. **Introduction –** Methodology adopted to prepare the district agriculture plan – major areas of focus – data collection – preparation and finalization of the draft action plan.
2. **General description of the district –** Location, area, irrigation, topography and climate, soils, land use pattern, irrigation, vision and strategy.
3. **SWOT analysis for the district –** Selection of indicators
4. **Development of agriculture sector -** Cropping pattern, major crops – crop wise strategy, seed sector, seed multiplication, schemes etc.
5. **Development of allied sectors –** Horticulture, animal husbandry, poultry, fisheries etc.
6. **District plan –** Overview of agriculture sector and crop wise listing in terms of rice, ground nut, millets etc.

6. Website of Tamil Nadu Government

The two documents are available in the website of the Tamilnadu Government. An overview of the contents is given below.

A. AGRICULTURE DEPARTMENT – CITIZENS CHARTER

Currently, this is the most comprehensive and up to date document providing information on various aspects of schemes of the department of agriculture.

The charter is divided into seven broad sections wherein details are given about various schemes

and programmes in a convenient classification. These sections are – Agriculture, Horticulture & plantation crops, Agricultural engineering, Tamil Nadu watershed development agency, Tamil Nadu Agricultural University, Seed certification and organic certification and Agricultural marketing and agricultural business. Each of these sections particularly the larger ones are sub-divided into sub-sections providing details for each scheme.

For example, the schemes under the Department of Agriculture have information about the following broad categories i.e.,

1. Assistance to farmers for quality seed production. This includes seed multiplication scheme for paddy, millets, pulses and oilseeds.
2. Assistance to farmers for increasing crop productivity. This includes schemes relating to oilseeds (ISOPOM), oil palm, maize, cotton etc.
3. Assistance to farmers for improving soil health
4. Crop insurance
5. Assistance to farmers affected by natural calamities from Calamity Relief Fund (CRF).
6. Assistance to farmers for plant protection measures
7. Assistance to farmers in extension and training. This includes farmers training centre and crop yield competitions.
8. Irrigated Agriculture Modernization and Water Bodies Restoration And Management (IAMWARM)
9. Seed village scheme
10. National Agricultural Development Programme (NADP / RKVY). This covers the paddy mission, pulse mission, Integrated Farming Systems (IFS) sustainable sugarcane initiative etc. This also includes a scheme for reviving millet cultivation in Tamil Nadu and the rainfed area development programme.
11. National Food Security Mission (NFSM) – these cover the crops of rice and pulses in various districts.
12. Agriculture technologies management agency (ATMA). This includes training demonstrations, exposure visits, awards, field days, farmer field schools, etc.

Details Provided

About each of the schemes listed details are given along the following lines.

- The description of the welfare scheme – the components, crops eligible and the support and subsidy extended.
- Eligibility conditions at the level of – farmers, specified categories of farmers such as SC / ST etc.
- The officer to be contacted.
- The scheme also specifies wherever relevant the geographical area where the programme is being implemented – normally this may be at the level of the district.

Seed Certification

A variety of schemes are available under the broad categories of seed certification. An overview is provided below.

1. Seed certification that enables the farmer to sell the seeds and claim subsidies or benefits under the certified seed category.
2. Seed testing - this may be carried out against a prescribed field to ensure purity during various transactions and to backup any claims for action.

B. MANUAL UNDER RIGHT TO INFORMATION ACT

This is a manual that is produced and updated to comply with the requirements under the Right to Information Act, 2005. The purpose of this manual is to inform the public about the department's organizational set up, functions and duties of its officers and employee and documents that are available with the department. It also specifies procedures followed in decision making and norms set for the discharge of functions. Particulars about arrangements that exists for consultation with or representation by members of the public are to be spelt out.

APPENDIX II : STRUCTURE OF THE HOUSEHOLD INTERVIEW QUESTIONNAIRE FOR BASELINE STUDY

The questionnaire explains the purpose of this study and seeks to get the consent of the respondent before proceeding further. The questionnaire is structured with 16 major sections with sub sections and queries. The respondent is given a choice to select one and in some case more than one of the options available in the questionnaire and also in some cases a brief explanatory note for descriptive information. The questionnaire collects both qualitative and quantitative data/information. A short description on each of the sections is given below.

A. **Village identification details:** Records the location of the hamlet with reference to the Revenue Village, Gram Panchyat under which it comes. The date of interview along with the name of the interviewer, time taken for the interview, verification details and data entry details. This section also covers the identification and background details such as educational, social and economic status of the respondent.

B. **Household characteristics:** Collects information on the respondent's household with reference to housing (type and ownership), details on the fuel used for cooking, toilet facilities, availability of electricity, drinking water source and availability, possession of a ration card and if benefited from MGNREGA scheme.

C. **Primary and secondary occupation of the household:** The various sources of household income are captured under this section from a list of occupations.

D. **Household assets:** The ownership of various assets from the list of household items.

E. **Productive assets:** Details of productive assets such as land holdings, well and bore well, pumps, farming and other equipments and machineries, livestock among other items and enterprises.

F. **Membership in CBOs:** Type and position if held among the family members is captured.

G. **Entitlements realized:** The awareness level of the respondent about the government schemes and if availed is captured in this section.

H. **Household roster:** Individual details of the household members with reference to age, sex, relationship, education and marital status.

I. **Occupation and income details of household:** The occupational details of the individual are collected along with the nature, days of employment and income.

J. **Household expenditure:** Details of the items of household expenditure and amount spent is collected under this section.

K. **Natural resources management:** This section captures the awareness and practices followed by the respondent with reference to soil fertility and soil erosion along with the information on access to advisory services and issues. Details about the irrigation facilities, area irrigated and awareness on water conserving methods.

L. **Seeds and other agriculture inputs:** Details of the crops cultivated across the seasons, variety of seeds, source, seed application rate and issues among other details along with the seed production and marketing.

M. **Crop management practices:** The details of the major crops cultivated, cost of cultivation, productivity, details regarding credit facility availed and issues, accessibility to agricultural extension services along with services availed and issues.

N. **Value addition and marketing:** Details of post harvest practices, value addition and marketing details along with the reasons for following such preferred practice.

O. **Livestock:** Details of the livestock owned, issues related to fodder and health, access and support of veterinary services.

P. **Home garden and food Practices:** Food habits of the households, awareness on balanced diet practices, nutrition along with the household food consumption pattern. Awareness of home vegetable and herbal gardens and issues.

APPENDIX III : STRUCTURE OF THE HOUSEHOLD SITUATIONAL ANALYSIS STUDY QUESTIONNAIRE FOR STUDY ON SEED SYSTEMS AT JAWADHU HILLS

The questionnaire explains the purpose of this study and seeks to get the consent of the respondent before proceeding further. The questionnaire is structured with 12 major sections with sub sections and queries. The respondent is given a choice to select one and in some cases more than one of the options available in the questionnaire and also in some cases a brief explanatory note for descriptive information. The questionnaire collects both qualitative and quantitative data/information. A short description on each of the sections is given below.

1. **Identification details:** This section collects the date of the interview and the name of the interviewer, information about the respondent details, i.e., name, age, sex, education and social category.
2. **Production assets:** Land holding status, if owning well/borewell, livestock, agricultural implements/machineries, sewing machines, petty shop among others.
3. **Membership in CBOs:** Ascertains if members of the household is a member in CBOs, nature of CBO and position if holding/ held. The awareness on their entitlements and if they have availed is also captured.
4. **Natural resource management:** Awareness and adoption of soil fertility retention practices followed.
5. **Irrigation systems:** Source of irrigation and extent of land covered. Awareness of organic farming and the practices adopted is also captured.
6. **Seeds and other agricultural inputs:** Information on the seasonal crop varieties and extent of area cultivated along with the source of seeds, seed rate and issues faced. Awareness of seed quality assessment and how determined by the respondent, awareness/ information on the seed life expectancy of various millets, storage method, quantity stored for use as seeds and the type of container stored. The questionnaire also queries on the level of awareness of the respondent on seed production, seed certification, seed marketing and insurance.
7. **Credit services:** This determines if credit facility was availed, with details on purpose, amount, source, loan type, interest rate, repayment schedule and satisfaction level.
8. **Availability and accessibility of agriculture extension services:** Ascertains the services availed, nature of services availed and satisfaction level.
9. **Post harvest technologies:** The existing practice of value addition, marketing and preference/ reason for the selected marketing channel and advantage of the preferred marketing channel for Samai, Ragi, Maize and Rice.
10. **Availability and taste of millets:** The ease of availability and taste and consumption preference along with the cooking time and shelf life after cooking.
11. **Features of the standing crops:** Characteristic of the millet varieties, i.e., duration, height, lodging, earhead appearance, yield etc.
12. **Home gardens and food practices:** The household food consumption practices, i.e., the cereals, vegetables, animal protein, fruits and milk and its frequency. Awareness of kitchen and herbal garden is ascertained and if practiced, issues related to the same.