

Andhra Pradesh Drought Adaptation Initiative (APDAI)

A Baseline Report: Mahaboobnagar and Anantapur Districts

**Prepared for
Society for Elimination of Rural Poverty (SERP)**

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ABBREVIATIONS

AHD	Animal Husbandry Department
AP	Andhra Pradesh
APDAI	Andhra Pradesh Drought Adaptation Initiative
APREGS	Andhra Pradesh Rural Employment Guarantee Scheme
APRLP	Andhra Pradesh Rural Livelihood Programme
APRPRP	Andhra Pradesh Rural Poverty Reduction Project
APMIP	Andhra Pradesh Mini Irrigation Project
BC	Backward Castes
CBO	Community Based Organization
CCIG	Climate Change Initiative Grant
CIG	Common Interest Group
CPR	Common Pool Resources
CRC	Chick Rearing Centre
CRD	Commissioner Rural Development
DDP	Desert Development Programme
DFS	Diversified Framing Systems
DPAP	Drought Prone Area Programme
DRDA	District Rural Development Agency
DWMA	District Water Management Agency
EC	Executive Committee
FCS	Fishermen cooperative society
FGD	Focus Group Discussion
GB	General Body
GP	Gram Panchayat
GoAP	Government of Andhra Pradesh
GOI	Government of India
LTA	Lead Technical Agency
ME&L	Monitoring, Evaluation and Learning
MMS	Mandal Mahila Samakhya
NPM	None Pesticide Management
NRM	Natural Resource Management
OC	Other Castes
PHRD	Policy and Human Resource Development
RMG	Raitu Mitra Groups
SAPAP	South Asia Poverty Alleviation Programme
SC	Scheduled Caste
ST	Scheduled Tribe
SERP	Society for Elimination of Rural Poverty
SHG	Self-Help Group
ST	Scheduled Tribe
VA	Village Assistant
VAS	Veterinary Assistant Surgeon
VO	Village Organization
WALTA	Water Land and Tree Act
WASSAN	Watershed Support Services and Activity Network
WB	World Bank

CHAPTER 1: INTRODUCTION

DROUGHT, MITIGATION AND ADAPTATION

Drought is among the more serious problems faced by rain-fed areas in India and is intricately related to the livelihoods of the people. At present in India around 60 % of net sown area is rain-fed and 745,914 sq. kms and 745,914 sq. kms spread across 180 districts in 16 states is drought prone.¹ Andhra Pradesh (AP) has the third largest drought prone area among states in India. Drought results in loss of livelihoods and human suffering at individual and community levels. The impacts of drought vary significantly even across small geographical areas, due to variations in weather patterns, differences in soil types, poor water availability, low access to markets and social circumstances.

People in many parts of arid and semi-arid India have been coping with drought on a regular basis.² Depending on their access to and control over resources, knowledge and support systems, the ability to cope with drought varies across individuals and communities. The Government of India (GOI) efforts to mitigate the impacts of drought are largely through thematic interventions in 5-year rural development programs such as the Drought Prone Area Programme (DPAP) and the Desert Development Programme (DDP)³ and short-term drought-relief programs. These measures, however, have not been able to tackle drought in the long term and drought prone areas are still vulnerable to erratic monsoon causing severe hardship to affected communities.⁴ And now, rain-fed areas also face challenges due to changing climate.⁵

There is therefore a need to develop drought adaptation approaches keeping in view, sustainable livelihoods, local contexts and changing climate. A range of livelihood alternatives combined with thematic solutions at the micro-level would form an appropriate sustainable livelihoods approach especially when dealing with uncertain meteorological conditions⁶ in arid and semi-arid regions of India and the state of AP.

¹ Ministry of Rural Development, GOI, Annual Report, 2000-01

² Average annual rainfall in arid regions is below 400 mm, and 550 - 800 mm in semi-arid regions.

³ Typical interventions of these programs are drilling bore wells, constructing check dams, de-silting tanks and plantation.

⁴ There are serious lacunae in the present policy framework related to rain-fed areas. For instance, there is a huge divide in public support in terms of investment, institutions and subsidized inputs between irrigated and rain fed areas.

⁵ Drought prone areas are most vulnerable to negative climate impacts, including water scarcity, decline in food production (due to monsoon variability) and increased potential for the spread of diseases. Thus, climate variability makes people in rain-fed areas more vulnerable to droughts than other areas.

⁶ The National Commission on Agriculture in India (1976) defines classifies droughts into three: *Meteorological droughts* occur when there is more than a 25 % decrease in rainfall from the normal over the area; *Agricultural droughts* occur when soil moisture and rainfall are inadequate for healthy crop growth to maturity and results in crop stress; and *hydrological droughts* may be a result of prolonged meteorological droughts that result in marked depletion of surface water and a fall in ground water levels.

ANDHRA PRADESH DROUGHT ADAPTATION INITIATIVE

In an effort to operationalize such an approach, the Government of Andhra Pradesh (GoAP) in collaboration with the World Bank (WB) launched the Andhra Pradesh Drought Adaptation Initiative (APDAI) in 2006. APDAI emphasizes a deeper integration of climate considerations into local action by effectively packaging drought adaptation measures into the existing institutional context at government and community levels. Thus, responses to drought risks are planned at small geographical scales taking into account both short-term and long term effects of drought, but rooted in current government programs and initiatives.

Objectives: The overall objective of APDAI is to enhance the drought adaptation capacity of affected communities and reduce their vulnerability to drought risks in the long run. To support these objectives, APDAI will:

- Identify gaps and missing links in ongoing drought-related programs and activities;
- Facilitate institutional integration at state, district and community levels for delivering drought-related assistance
- Design and test the innovative methods and instruments for helping selected communities to adapt to drought, targeting different groups within these communities (e.g. medium farmers, marginal/small farmers, landless and poorest)
- Improve awareness on drought adaptation options and approaches; and
- Disseminate the results of the pilot efforts in order to build support and demand for wider replication.⁷

Implementation Phases: APDAI is being implemented in two phases due to different modes of financing. Phase 1 of the pilot program (June 2006–April 2007), financed by a WB-executed Trust Fund, worked in 6 villages in three mandals of Mahaboobnagar district.⁸ Phase 2 of the pilot program started in November 2007 and expanded the project to an additional 9 villages in Mahaboobnagar and 10 new villages in Anantapur district, with the option to work in more villages in Anantapur, if possible.

Funding and Oversight: The implementation of APDAI Phase 2 is supported by the Japan Policy and Human Resource Development (PHRD) Climate Change Initiative Grant (CCIG) and the World Bank. Pilot activities are implemented by the Society for Elimination of Rural Poverty (SERP)⁹ in collaboration with the District Collectors of Mahaboobnagar and Anantapur districts, and under oversight of the Principal Secretary, Department of Rural Development through the office of the Commissioner, Rural Development (CRD), GoAP.

Institutional arrangements: Andhra Pradesh has made various efforts in the last two decades to organize rural women into self-help groups (SHGs) in order to make them partners in the development process. Today, SHGs have been formed in every village of the state and federated at village and mandal levels. Thus, representatives from all SHGs in a village form a Village Organizations (VO), while representatives from all VOs in a Mandal constitute a

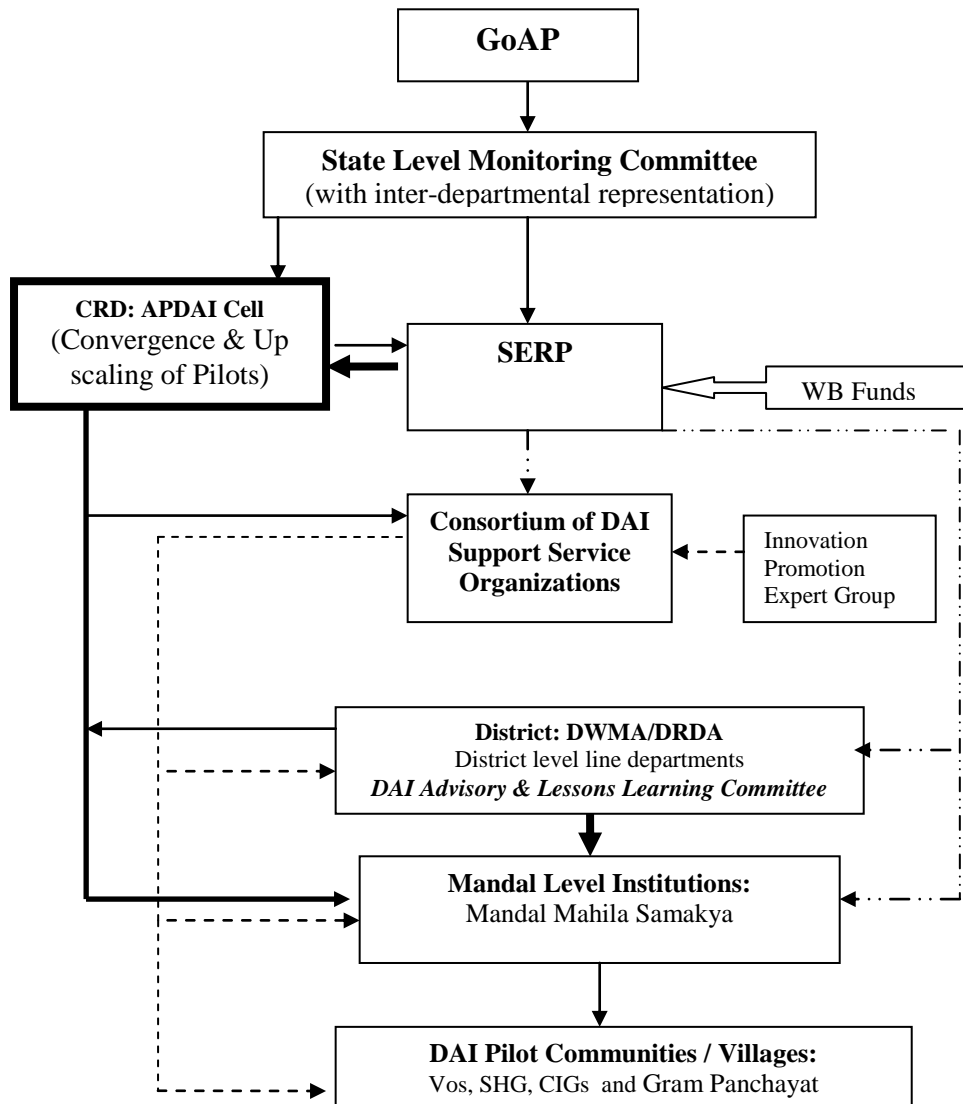
⁷ From the APDAI Concept Note, World Bank, New Delhi.

⁸ A mandal is a sub-district administrative area. There are a total of 64 mandals in Mahaboobnagar district and 63 mandals in Anantapur district, each Mandal being approximately 300 sq. km on average.

⁹ SERP is an independent autonomous society registered under the Indian Societies Act and established in 2000 by the Government of Andhra Pradesh to implement rural development projects in a professional and accelerated manner,. SERP was set up with financial assistance from the World Bank with the specific objective to implement state-wide, community demand driven rural poverty alleviation programs.

Mandal Mahila Samakhya (MMS) and representatives from all MMSs in a district comprise the Zilla Samakya. SHGs have built up considerable human, social and financial capital, and currently MMSs operates a number of government programs. APDAI therefore implements its pilots by capitalizing on the institutional strengths of the SHG structure (Figure 1.1).

Figure 1.1: Institutional Arrangements of APDAI



Legend:

- Monitoring & Evaluation
- Support Services Flow
- Funds Flow
- Arrangements in phase – II

As Figure 1 shows, SERP implements APDAI through MMSs. Each MMS has been provided with a support team¹⁰ for project implementation while the APDAI Cell placed in the CRD oversees the implementation process. The Watershed Support Services and Activity Network (WASSAN) is the Lead Technical Agency (LTA) appointed to provide technical support to MMSs for the implementation of APDAI. The LTA team includes a project manager, pilot-specific anchor persons and resource persons.

¹⁰ The APDAI support team comprise of Mandal Coordinator, Technical Assistant, Village Assistant and Mandal Resource Persons.

For effective delivery systems the following institutional processes were initiated: (i) establishing linkages between SHGs and Line Departments (such as the Departments of Agriculture, Forestry, Animal Husbandry and Fisheries) at the district level; (ii) promoting para-workers to assist and support at the village level;¹¹ and (iii) training SHG members in agro-based skills so that they can help promote micro-enterprises to provide better inputs and services for farming and livestock development. These strategies are based on a set of commonly-held assumptions (Table 1.1).

Table 1.1: Assumptions for the Institutional Arrangements

Assumption	Narration
Institutional environment	Institutions provide the basic structure to reduce uncertainty in exchange, and hence interventions can achieve better outcomes given favorable institutional conditions.
Opportunity structures	When large numbers of women are engaged in economic activities, they might have impact on the norms and values within their communities. Women in groups could have stronger negotiating power when dealing with government agencies, communities, families and business related entities.
Institutional convergence	Line departments seem to have limitations in adjusting their operational procedures in line with local conditions. It is possible to promote technical and social innovations by facilitating greater role for community based organizations.
Transfer of knowledge	By working together, women will learn from each other their respective technical, marketing and managerial skills. Further, women are more likely to make informed choices as they are in possession of necessary information.

Sample Selection: APDAI is operational in Anantapur and Mahaboobnagar districts which are among the chronically drought-prone and economically most vulnerable areas of the state. Anantapur district is a natural famine zone¹² with an average precipitation of 544 mm per annum, which is lowest in the state (39 % lower than state average) and second lowest in the country, while Mahaboobnagar district has the second lowest average annual rainfall in the state.

Within each district, mandals were selected on the basis of criteria agreed jointly by the LTA team, the Program Manager, APDAI Cell and the Project Directors of the District Water Management Agency (DWMA) in both districts (see Box 1.1).¹³

¹¹ Para-workers are local youth who are selected and provided some basic training by Line Departments to provide community-level support to departmental activities. They are not staff of the Line Departments and do not receive any payment from these Line Departments, but are allowed to collect charges for village-level services such as vaccination and artificial insemination.

¹² The Government of India brought Anantapur district under the fold of the DPAP during 1970s, but since the district slipped from semi-arid to arid status in 1990s, it was included under the DDP subsequently.

¹³ The only exception is Nallacheruvu Mandal in Anantapur district which, although it was not part SAPAP, fulfils the rest of the criteria. Thus, for instance, MMSs were formed 8 years ago in Gandlapanta Mandal, while in Nallacheruvu, the MMS was formed in 2003; Gandlapanta and Nallacheruvu are considered to be severely drought-affected mandals in the district, with average rainfall being 600-700 mm and a low percentage of irrigated area; there is a high incidence of migration and other social distress factors related to crop failures in these mandals; and both mandals have experience in NRM-related activities, with several watershed development programmes under implementation, including APRLP, and the NPM programme

Box 1.1: Criteria for selection of mandals

- Maturity of the MMS and its experience in taking up Natural Resource Management (NRM) programs (preference was given to mandals that were part of the South Asia Poverty Alleviation Programme (SAPAP) program and the Indira Kranti Patham (IKP).¹)
- High drought-proneness and adverse impacts as indicated by severe distress factors like migration
- Willingness or level of motivation of the community to work on drought adaptation related aspects
- Low potential for irrigation development

Of these, the main criteria were the age and maturity of MMS and village level institutions on the assumption that mature and capable institutions would enable quick grounding of pilot activities. After an intense orientation process where the LTA team oriented the MMSs on APDAI objectives, activities and possible outputs, three mandals in Mahaboobnagar, viz., Doulatabad, Kosigi and Bommaraspeta mandals and two mandals in Anantapur, viz., Gandlapenta and Nallacheruvu mandals were selected.

Within each mandal, villages were selected based on criteria jointly agreed between GoAP and the WB (see Box 1.2).

Box 1.2: Criteria for selection of villages

- Availability of active and relatively well organized community institutions, such as SHGs and farmers' associations and societies
- Presence of relevant on-going programs such as APRPRP, AP-REGS, APRI.P and SAPAP.

From the 15 villages chosen in Mahaboobnagar, 2 villages were subsequently dropped by the MMSs in Doulatabad and Bommarajpet, due to the unsatisfactory performance of the Village Organizations in these villages and APDAI is currently operational in 13 villages in Mahaboobnagar (Table 1.2).

In Anantapur, however, village selection could not proceed as it had in Mahaboobnagar since Gram Panchayats here are quite large and consist of several hamlet villages (also called habitations), extending up to a maximum of 20 per Gram Panchayat. Further, while each Gram Panchayat in Mahaboobnagar had only one village (or habitation) and one VO, there was more than one VO per Gram Panchayat in Anantapur, with each VO consisting of SHG representatives from 1 – 9 hamlet villages. In Anantapur, therefore, it was decided to cover five VOs per mandal for easy grounding and monitoring of the pilots. These five VOs together cover 29 hamlet villages spread across 11 Gram Panchayats in Anantapur. Thus APDAI is currently operational in a total of 42 hamlet villages spread across 24 Gram Panchayats in the two districts (Table 1.2).¹⁴

¹⁴ See Appendix 2 for full sample details.

Table 1.2: Distribution of project villages

	Project (hamlet) Villages	Gram Panchayats of Project (hamlet) Villages	Number of VOs in Project (hamlet) Villages	Number of SHGs in VOs of Project (hamlet) Villages
ANANTAPUR				
1.Nallacheruvu Mandal	9	4	4	64
2.Gandlapenta Mandal	20	7	5	88
Total Anantapur	29	11	9	152
MAHABOBNAGAR				
1.Kosigi Mandal	5	5	5	43
2.Doultabad Mandal	4	4	4	156
3.Bommaraspet Mandal	4	4	4	104
Total Mahaboobnagar	13	13	13	303
OVERALL TOTAL	42	24	22	455

Note: Each Gram Panchayat in Anantapur district covers more hamlet villages than have been selected for the APDAI pilots. More correctly, the 29 hamlet villages covered by APDAI fall under 11 Gram Panchayats.

Pilot Initiatives: APDAI aimed to develop of a package of tested measures for drought adaptation for sustainable livelihoods in rainfed areas. Therefore, a number of pilots have been started covering agriculture production systems, livestock production systems, natural resource management, livelihoods of vulnerable groups and economic support tools for different livelihood groups (Table 1.3).

Table 1.3: Broad Areas of Interventions under APDAI

	Area		Pilots
1	Agriculture production	1.1	Diversified farming systems (DFS)
		1.2	Plough bullocks
		1.3	Seed bank
		1.4	System of rice intensification (SRI)
		1.5	Leased land farming
2	Livestock production	2.1	Community-managed livestock services (vaccination)
		2.2	Fodder bank
		2.3	Backyard poultry
		2.4	Chick rearing centre (CRC)
		2.5	Breed improvement in sheep*
		2.6	Common interest group (CIG) of goat rearers
		2.7	Goat crèche (goat kids rearing centre)
		2.8	Inland fishermen's cooperatives
3	Natural resource management	3.1	Groundwater management
		3.2	Common property resource (CPR) management
4	Economic support tools	5.1	Livestock insurance
		5.2	Millets in the government Public Distribution System (PDS)

*Another pilot on introducing ram lambs did not yield expected results and was discontinued.

Pilot action areas and outputs: Each pilot is expected to lead to specific outcomes and impacts addressing drought adaptation (Table 1.4).

Table 1.4: Pilot outputs and impacts

Issues and background	Action areas	Outcomes and Impacts
<p>Diversified farming systems (DFS)</p> <ul style="list-style-type: none"> ▪ Low water/ moisture holding capacity ▪ Nutrient loss due slope/undulated soils ▪ Low soil fertility/ productivity ▪ Shortage of organic manure ▪ Reduction in biomass incorporation into soil ▪ Excessive use of chemical fertilizers 	<ul style="list-style-type: none"> ▪ Providing one compost pit per acre ▪ Planting multi purpose trees on bunds ▪ Inter-cropping to incorporate biomass ▪ Using liquid manure ▪ Applying tank silt ▪ Conserving soil and moisture ▪ Creating linkages with AP-REGS¹⁵ 	<ul style="list-style-type: none"> ▪ Diversification of crops ▪ Increase in compost and Bio-mass incorporation ▪ Improved soil fertility and moisture holding capacity ▪ Increased crop yields
<p>Plough bullock</p> <ul style="list-style-type: none"> ▪ Plough bullocks is a major constraints for poor farmers ▪ Low yields result from the constraint of plough bullocks 	<ul style="list-style-type: none"> ▪ Purchasing and supplying bullocks to members on annual hire basis ▪ VO providing vaccination and insurance services ▪ Operating bullocks on commercial basis 	<ul style="list-style-type: none"> ▪ Plough bullock constraint overcome for DFS farmers ▪ Income from hiring out plough bullock labor
<p>Seed bank</p> <ul style="list-style-type: none"> ▪ Non-availability of seed for main/ contingency crops ▪ Non-availability seeds of intercrops/fodder crops ▪ Higher dependency on external agencies for seed 	<ul style="list-style-type: none"> ▪ Procuring and supplying seeds to farmers ▪ Forming a net work of farmers, breeders, seed producers, processing plants and seed sellers 	<ul style="list-style-type: none"> ▪ Infrastructure and seed storage facilities created ▪ Better seed availability for farmers ▪ Reduced dependence on outsiders for seed
<p>System of Rice Intensification (SRI)</p> <ul style="list-style-type: none"> ▪ Farmers with water facility in rain-fed areas prefer rice cultivation ▪ Water scarcity is already an intricate problem in rain-fed areas; ground water tables have been falling at alarming rate ▪ Scarcity of water is more common among farmers engaged in conventional water intensive (inundation) method of rice cultivation 	<ul style="list-style-type: none"> ▪ Promoting SRI under bore wells and tanks ▪ Managing water resources carefully 	<ul style="list-style-type: none"> ▪ Comprehensive management of resources such as land, seed, water and nutrients ▪ Less water used than in conventional rice cultivation ▪ Reduced seed and other input cost ▪ Increased net income
<p>Lease land farming</p> <ul style="list-style-type: none"> ▪ Single women are often without any means of livelihoods ▪ They own no land, few productive assets and opportunities ▪ They face higher risks than any other group 	<ul style="list-style-type: none"> ▪ Organizing single women households into a CIG ▪ Taking agricultural land on lease ▪ Providing technical and financial support for the development of leased-in land 	<ul style="list-style-type: none"> ▪ Improved livelihood opportunities ▪ Increased net income
<p>Community-managed livestock services (vaccination)</p> <ul style="list-style-type: none"> ▪ Lack of awareness about and 	<ul style="list-style-type: none"> ▪ Communication campaign in village on disease management. 	<ul style="list-style-type: none"> ▪ Improved community awareness on vaccination ▪ Institutionalization of

¹⁵ The Government of India passed the National Rural Employment Guarantee Act, 2005. This Act gives a legal guarantee of at least one hundred days of wage employment in a financial year to a rural household, whose adult members volunteer to do unskilled and manual work. The Act calls for the formulation of Rural Employment Guarantee Schemes by the State Governments keeping in view the main features of the Act. Accordingly, the Government of Andhra Pradesh formulated the Andhra Pradesh Rural Employment Guarantee Scheme, which is being implemented as a Centrally Sponsored Scheme (CSS) on cost sharing basis between the Centre and the State in the ratio of 90:10.

Issues and background	Action areas	Outcomes and Impacts
<ul style="list-style-type: none"> access to vaccination services ▪ Supply constraints in vaccines ▪ Absence of back up support from Animal Health Department for community level institutions ▪ Limited role for community based organizations (CBOs) in vaccination 	<ul style="list-style-type: none"> ▪ Making available trained para-workers ▪ Planning and conducting vaccination camps 	<ul style="list-style-type: none"> community-based vaccination services ▪ More animals vaccinated regularly ▪ Lower disease rate ▪ Lower death rate
<p>Fodder Bank</p> <ul style="list-style-type: none"> ▪ Seasonal fodder scarcity ▪ Reduced availability of tree-based fodder ▪ Lack of community-based institutional mechanisms for fodder security 	<ul style="list-style-type: none"> ▪ Organizing households with fodder scarcity into a CIG ▪ CIGs procuring and distributing fodder to its members ▪ CIGs promoting fodder production 	<ul style="list-style-type: none"> ▪ CIGs formed and strengthened ▪ Improved access to fodder for CIG members during scarcity period ▪ Increased area under fodder production ▪ Increased fodder production by members
<p>Backyard Poultry</p> <ul style="list-style-type: none"> ▪ There is demand for eggs in the market ▪ But a high incidence of disease among birds ▪ Lack of access to vaccination and health care ▪ High incidence of predation of birds 	<ul style="list-style-type: none"> ▪ Supplying egg-laying variety birds ▪ Providing vaccination services and primary health care for backyard poultry. ▪ Providing insurance cover 	<ul style="list-style-type: none"> ▪ Increased bird population in program villages ▪ Increased annual production and marketing of eggs ▪ Improved access to vaccination and health care services ▪ Increased income
<p>Chick Rearing Centre (CRC)</p> <ul style="list-style-type: none"> ▪ Availability of day-old chicks is a problem 	<ul style="list-style-type: none"> ▪ Establishing chick rearing center ▪ Rearing one-day old chicks for 45 days ▪ Selecting and training SHG members to manage CRC ▪ Supply of 45 day birds to SHG members 	<ul style="list-style-type: none"> ▪ Chick rearing centers established ▪ CRC s running profitably ▪ Local demand for chicks met
<p>Breed improvement in sheep</p> <ul style="list-style-type: none"> ▪ Inbreeding is resulting in high mortality rate ▪ Cross breeding with Nellore breed makes them disease-prone ▪ Quantity of wool is lower in mixed breed sheep 	<ul style="list-style-type: none"> ▪ Introducing pure Deccani breed rams in the flock ▪ Ram-lamb rearing by women ▪ Rearing nucleus flock of pure deccani breed ▪ Forging linkages with banks and Line Departments for credit and support services respectively 	<ul style="list-style-type: none"> ▪ Increased flocks with pure Deccani breed rams ▪ Increased weight of sheep ▪ Reduced mortality rate of sheep ▪ Increased wool production
<p>Goat rearers CIG</p> <ul style="list-style-type: none"> ▪ No accessibility to medicine ▪ High rate of kids mortality ▪ No insurance support ▪ No practice of supplemental feeding and less body weight ▪ Poor marketing facilities 	<ul style="list-style-type: none"> ▪ Forming a CIG of goat rearers and its network ▪ Institutionalizing health services ▪ Addressing fodder issues ▪ Setting up a kid rearing centre. 	<ul style="list-style-type: none"> ▪ Improved access to services ▪ Reduced mortality of goat kids ▪ Increased fodder availability
<p>Goat crèche</p> <ul style="list-style-type: none"> ▪ No proper care for goat kids ▪ Lack of hygienic and healthy surroundings in kid rearing ▪ High mortality of goat kids below 4 months 	<ul style="list-style-type: none"> ▪ Setting up kid rearing centers ▪ Providing trained caretakers ▪ Providing nutritive and supplementary feed 	<ul style="list-style-type: none"> ▪ Healthy kids ▪ Increased weight of kids ▪ Goat rearers' time saved
<p>Tank fishermen's cooperatives</p> <ul style="list-style-type: none"> ▪ Fishermen cooperatives are in the clutches of middlemen 	<ul style="list-style-type: none"> ▪ Organizing fishermen into cooperatives ▪ Forming women into a CIG for 	<ul style="list-style-type: none"> ▪ Cooperatives strengthened ▪ Improved revenue from fish production

Issues and background	Action areas	Outcomes and Impacts
<ul style="list-style-type: none"> ▪ Lack of institutional credit for fish seed, feed, etc. ▪ No transparency in management of cooperatives ▪ Lack of regular technical support 	<ul style="list-style-type: none"> marketing ▪ Strengthening institutions ▪ Providing credit, technology and infrastructure support to fishermen cooperatives 	<ul style="list-style-type: none"> ▪ Greater control by cooperatives over fishing ▪ Increased income from fishery and subsidiary activities
<p>Groundwater Management</p> <ul style="list-style-type: none"> ▪ Groundwater extraction from wells exceeds natural replenishment, and many wells have gone dry ▪ Farmers are indebted as they are forced to sink more wells ▪ Groundwater is mostly under individual control 	<ul style="list-style-type: none"> ▪ Organizing farmers into a CIG for collective use of ground water ▪ Installing distribution pipeline ▪ Evolving and enforcing social regulations on water sharing, regulation of sinking bore wells, etc. 	<ul style="list-style-type: none"> ▪ CIG formed and strengthened ▪ Additional area brought under cultivation Increase in farmers using sprinklers ▪ No new bore wells sunk ▪ Increased net income
<p>Common Property Resource Management</p> <ul style="list-style-type: none"> ▪ Decline in availability of CPRs ▪ Deterioration of CPRs has accentuated economic stress and risk among rural poor ▪ Regeneration of CPRs would improve adaptive capability of the rural poor 	<ul style="list-style-type: none"> ▪ Organizing dependent users into CIG ▪ Obtaining leasing rights for VO from GP ▪ Taking up plantation and soil and moisture conservation measures ▪ Facilitating linkages with government programs 	<ul style="list-style-type: none"> ▪ CIG formed and strengthened ▪ Social regulations enforced by community ▪ Linkages made with APREGS ▪ Wage employment increased ▪ More trees (varieties) ▪ Usufructs rights to CIG members

AP DAI MONITORING, EVALUATION AND LEARNING (ME&L)

SERP commissioned Poverty Learning Foundation (PLF) to carry out monitoring, evaluation and learning (ME&L) of APDAI. Terms of Reference for this study are given in Annexure 1. The main objective is to establish relevant baseline data on different variables and parameters in order to compare impacts with the pre-project situation.¹⁶ The ME&L system is to assess the impact of APDAI pilots on different livelihood groups and provide regular feedback to project management at state and district levels on the progress of the pilot. Also, it is expected that ME&L will facilitate internal learning by sharing of experiences among the key stakeholders and users at all levels, i.e., State, District, MMS, VO, SHGs and Gram Panchayats (GPs). This ME&L Baseline Report describes the baseline situation prior to project implementation in both Anantapur and Mahaboobnagar districts. A second report in mid 2009 will assess project performance against this baseline.

BASELINE STUDY

Under Phase 2 of APDAI, and as part of ME&L activities, a generic baseline survey and pilot-specific baseline surveys were carried out.

Generic Baseline: The purpose of the generic baseline is to capture the contextual and background information about project villages. Generic baseline data were collected from MMSs, VOs and key informants in all project hamlet villages in Mahaboobnagar and Anantapur. The information gathered includes the social profile of village, functioning of

¹⁶ The baseline year for Mahaboobnagar is 2006 and for Anantapur it is 2007

local institutions, details of household economy, natural resources, ongoing development projects and drought coping strategies. In addition, secondary information was also gathered from the Mandal Office, Village Secretary and the MMS on the local economy (e.g., infrastructure, distance to markets) and local institutions. The format used in the generic baseline survey is in Annexure 3 while findings are detailed in Chapter 2.

Pilot-Specific Baselines: Baseline data were also collected for all the APDAI pilots and their support systems, as part of a three-time point data collection plan, i.e., baseline, followed by two time points corresponding to the monsoon crop (*kharif*¹⁷) and the dry season or winter crop (*rabi*¹⁸) of 2008-09, in order to understand the process, immediate benefits and learning at each stage. The pilot-specific formats used for this baseline study are in Annexure 4, while the detailed findings are in chapters 3, 4, 5 and 6 of this report. The distribution of pilots, as on December 2008, is given in Table 1.4. It may be however noted that there is overlap of members across pilots as some members have participated more than pilot. Also, economic support tools pilots are still in a conceptual stage and hence this report does not provide baseline information about these pilots.

Approach: WASSAN being the LTA for implementing APDAI provided base information on various pilots, which was used to formulate the ME&L framework. This was followed by a detailed discussion with representatives of the World Bank, WASSAN and APDAI. It was felt necessary to track pilots once in six months, as APDAI implements pilots in four stages, namely conceptualization, creating a few small-scale pilots and expanding pilots to program level and up-scaling.

Base periods: For every pilot, the base period is the production period immediately prior to the start of the pilot. Thus, for DFS pilot farmers in Phase 1 villages, *kharif* 2006 is the base period, while it is *kharif* 2007 for DFS pilot farmers in Phase 2 villages.

Sampling for pilot-specific baselines: Pilot initiatives are implemented either through individual members (e.g., backyard poultry) or common interest groups (e.g., CPR) (Table 1.5). Hence, the data for each of these pilots were collected from a sample of members when the total number of individual members was large (e.g., DFS, vaccination and poultry pilots) and from all members when the total number was small (e.g., in ground water management, CPR management, seed banks, and most livestock pilots).

Table 1.5: Distribution of APDAI Pilots across Districts

	Pilots	Individual or group based	Participants			Hamlet Villages		
			Mahaboob-nagar	Anantapur	Total	Mahaboob-nagar	Anantapur	Total
1	Diversified farming systems	Individual	1,293	461	1,754	14	13	27
2	Plough bullocks	Individual	22	-	22	9	-	9
3	Seed bank*	Group	6	-	6	13	14	27

¹⁷ The monsoon crop in India is known as the *kharif* crop (the term *kharif* means autumn in Arabic). Kharif crops are usually sown with the beginning of the first rains in July, during the south-west monsoon season (June to October), and harvested in October-November.

¹⁸ The dry season winter crop that is harvested in spring is known as the *rabi* crop (the term Rabi means "spring" in Arabic). The crop is usually sown in October-November and harvested in January or February. Summer crops are grown between March and May

	Pilots	Individual or group based	Participants			Hamlet Villages		
			Mahaboob-nagar	Anantapur	Total	Mahaboob-nagar	Anantapur	Total
4	System of Rice Intensification	Individual	39	30	69	11	8	19
5	Land lease farming	Group	30	4	34	1	4	5
6	Fodder bank	Individual	52	46	98	4	4	8
7	Community-managed livestock services (vaccination)	Group	1,722	-	1,722	21	13	34
8	Backyard Poultry	Individual	843	-	843	-	13	13
9	Chick rearing centre	Individual	8	-	8	-	6	6
10	Breed improvement in sheep	Individual	4	-	4	-	1	1
11	Goat rearers CIG	Group	121	31	152	4	11	15
12	Goat crèche	Group	1	-	1	-	1	1
13	Tank fishermen's cooperatives	Group	73	26	99	4	3	7
14	Ground water management	Group	5	?	5	3	1	4
15	CPR management	Group	5	?	5	14	1	15
TOTAL			4,227	598	4,825			

* The numbers indicate entrepreneurs engaged in the activity but not farmers who received seeds. Thus, in Mahaboobnagar district, SHG members were the entrepreneurs running the seed bank, while in Anantapur, the MMSs took the responsibility and distributed seeds through VOs.

Detailed information was collected using structured formats from individual members and groups thus selected. A total number of 253 individual members and 43 groups were covered for the pilot-specific baseline survey across the project (Table 1.6).

Table 1.6: Sample sizes by pilots

	Pilot	Individual or group-based	District-wise		Across the Project	
			Anantapur	Mahaboobnagar	Individuals	Groups
1	Diversified farming systems	Individual	27	41	68	
2	Plough bullocks	Individual	0	22	22	
3	Seed bank	Group	4	4		8
4	System of rice intensification	Individual	21	19	40	
5	Leased land farming	Group	1	4		5
6	Community-managed livestock services (vaccination)	Individual	26	42	68	
7	Fodder bank	Group	3	4		7
8	Backyard Poultry	Individual	0	42	42	
9	Chick Rearing Centre	Individual	1	5	6	
10	Sheep: Breed improvement	Individual	0	3	3	
11	Goat rearers CIG	Group	5	11		16
12	Goat crèche	Group	0	1		1
13	Tank fishermen's cooperative	Group	0	4		4
14	Ground water management	Group	0	1		1
15	CPR management	Group	0	1		1
Sample Totals					253	43

Limitations of the study: A study of this kind has some limitations. First, the year of starting the pilot is not uniform across the villages participating in the pilot. Next, the fact that some of the pilots including CPR and groundwater management are operational only in one village makes it difficult to compare impacts. Further, members of groups have changed over time, as for instance in the case of the Chick Rearing Centre (CRC). Also, in Anantapur district, baseline information for several pilots like groundwater management, CPR management, backyard poultry, CRC, bullocks, fodder bank etc could not be collected as selection of the members under these pilots is still in progress. On the other hand, in Mahaboobnagar, some of the initial CIGs were dissolved (e.g., fodder bank, land lease farming) as they were not functioning effectively and new ones were formed. In such cases, the baseline data had to be collected again from the newly formed groups.

STRUCTURE OF THIS REPORT

The next chapter (chapter 2) presents the findings of the generic baseline survey. Chapter 3 gives the baseline situation related to agriculture production systems, Chapter 4 presents that for livestock production systems, while Chapter 5 is on groundwater and CPR management. Conclusions of the study are presented in the final chapter.

CHAPTER 2: GENERIC BASELINE SURVEY OF PROJECT VILLAGES

An important factor that will affect the success of APDAI pilots is the context in which they operate. This chapter, therefore, provides background information on the 13 project villages in Mahaboobnagar and 29 project (hamlet) villages in Anantapur district. This information includes size and the social composition of villages, incidence of poverty, women-headed and landless households, land, livestock and water resources, cropping pattern, trends in resource use, livelihoods, migration, stress and coping strategies and access to government programs.

DEMOGRAPHIC PROFILE

Average size of villages: At the aggregate level, each village has 95 households on average, although one out of every 10 habitations has more than 500 households.

Caste composition: Overall, most (85%) of the households in the pilot villages surveyed are socially disadvantaged, being either from Backward Castes (59 %), Scheduled Castes (16 %) or Scheduled Tribes (10 %).

Women headed households: In the context of less-developed tracts, incidence of women headed households serves as an important proxy for vulnerability. Out of 8079 households in the study area, households of this category account for 13% of total households (Table 6.2). Out of five categories indicating the marital status of woman or the spouse, ‘widowed’ category emerges as the major one accounting for 55% of the total number of women-headed households, followed by ‘separated’ and ‘husband ill’ (13% and 11% respectively). In as many as 10% of cases each, the women head the household as either they are divorced or the husband is on long term migration. Such women have to bear the entire responsibility of managing the household. In relative terms, Mahaboobnagar registers slightly higher incidence on the dimension in question as compared to Anantapur (Table 2.1).

Table 2.1: Women headed households

Category	Anantapur		Mahaboobnagar		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
Widow	118	64	579	55	697	56
Separated	19	10	146	14	165	13
Divorced	2	1	118	11	120	10
Husband ill	12	7	126	12	138	11
Husband in long term migration	34	18	86	8	120	10
Total women-headed households	185	100	1055	100	1240	100
Total households	1510		8079		9589	

LAND RESOURCES

Land holdings: Small farmers account for 53% of all farmers distantly followed by marginal farmers accounting for slightly over one-fourth. In the entire group, large farmers constitute only 3% only. Thus, overall, some 80% of villagers surveyed are small and marginal farmers, with another 15% being medium farmers and landless and large farmers accounting for 3% (Table 2.2). Further, 14% of households surveyed in Anantapur and 1% in Mahaboobnagar were landless.

Table 2.2: Distribution of landholding groups

Land holding group	Number of households surveyed			Percentage to total		
	Anantapur	Mahaboobnagar	Total	Anantapur	Mahaboobnagar	Total
Landless	185	141	326	14%	1%	3%
Marginal farmers (up to 2.5 acres)	319	2627	2946	23%	27%	27%
Small farmers (2.5 - 5 acres)	547	5254	5801	40%	55%	53%
Medium farmers (5 - 25 acres)	281	1364	1645	21%	14%	15%
Large farmers (above 25 acres)	35	251	286	3%	3%	3%
Total	1,367	9,637	11,004	100%	100%	100%

WATER RESOURCES

Irrigation bore wells: Of the 1801 bore wells in the project villages surveyed, 153 are defunct, and each functioning bore well irrigates little over a hectare on average (Table 2.3).

Table 2.3: Distribution of bore wells, open wells and tanks in project villages

Water resources	Number/Area irrigated	Anantapur	Mahaboobnagar	Overall
Bore wells	Total	296	1,658	1,954
	Functioning	276	1,525	1,801
	Area irrigated (hectares)	339	1,448	1,787
Open wells	Total	188	57	245
	Functioning	132	23	155
	Area irrigated (hectares)	100	15	115
Tanks	Total	32	30	62
	Area irrigated (hectares)	304	1,331	1,635

Open wells: There are 245 open wells in the surveyed villages, more than three-fourths of which are in Anantapur district (Table 2.4). Almost 70% of open wells are functioning in Anantapur as against 40% in Mahaboobnagar district. Each open well irrigates less than 1 hectare.

Tanks: There are 62 tanks in the project villages surveyed (Table 2.3). Each tank in Anantapur irrigates 10 hectares (ha) downstream as against 44 ha in Mahaboobnagar.

Ground water table: The groundwater table is at 110 feet on average in the villages surveyed in Mahaboobnagar and 70 feet in those surveyed in Anantapur, although huge variations exist across habitations. In Mahaboobnagar, for instance, it varies from 50 to 240 feet, while in Anantapur it ranges from 20 to 120 feet.

TRENDS IN RESOURCE USE

Changes in cropping pattern: In Mahaboobnagar, paddy and red gram continue to be the major kharif crops in a majority of habitations, while more habitations are now growing green gram as a minor kharif crop compared to 1980. In rabi, paddy and groundnut are the major crops and their acreage has significantly improved from 1980 to the current period. Red gram is the preferred minor rabi crop along with sunflower, which is grown in a relatively large number of habitations.

In Anantapur, there has been a shift in the crops grown in *kharif* from jowar, bajra, cow peas and *teegala sanaga* (a traditional groundnut variety) and to groundnut, sunflower and red gram. In relative terms, the shift is quite conspicuous from bajra and teegala sanaga to groundnut (4 habitations each) and in four habitations it was from teegala sanaga to redgram. In the *rabi* season, there is a clear shift from bajra, finger millets and horse gram to sunflower and paddy between 1980 and 2008. During summer months, maize, vegetables and sunflower continue to be grown as major crops while there was a shift (in one habitation) from tomatoes to onions.

Land and water resources: The trends captured through specially conducted FGDs in each habitation (see Appendix 4 for details of the method used and the findings) basically show a general decline in cultivated land, forest land, waste land, open wells, community tanks and groundwater over the past 20 years (Table 2.4). The extent of the decline is well marked in the case of ground water levels while it is moderate for land cultivated by large farmers, waste land and open wells, and low in the case of forest land and community tanks. In all cases, the decline is mostly attributed to population growth. The number of bore wells, however, has increased significantly while the land cultivated by small and marginal farmers has also increased but not by much.

Table 2.4: Trends in Resource Use in Surveyed Villages

Resource	Trend ¹⁹
Land cultivated by large farmers	-- -- for Mahaboobnagar and ++ for Anantapur
Land cultivated by small & marginal farmers	+
Forest land	--
Waste land	-- --
Open wells	-- --
Community tanks	--
Bore wells	+++
Ground water level	-- -- --

¹⁹ The trend denotes change from 20 years ago and 10 years ago to the current level. This table presents an aggregated picture for the study area including Mahaboobnagar and Anantapur districts. Marks of (+) or (-) in 'Trend' column in the Table indicate the intensity of change. A single mark signifies low intensity, a double mark indicates moderate intensity and a triple mark indicates high intensity.

AGRICULTURAL IMPLEMENTS AND INFRASTRUCTURE

Agricultural implements: There is a large number of pump-sets (nearly 19 pump-sets for every 100 population) in the surveyed habitation villages, and an average of 9 tractors, 1.6 threshers and 2 sprayers for every 1000 population (Table 2.5).²⁰

Table 2.5: Possession of implements

Implements	District and number of implements		Total
	Anantapur	Mahaboobnagar	
Pump sets	15	1,658	1,673
Tractors	14	75	89
Threshers	2	13	15
Power sprayers	5	13	18
Flour and grinding mills	3	-	3
Milk collection centers	4	-	4
Total	43	1,759	1,802

Almost every habitation in Mahaboobnagar (except Gundlappally) has a tractor, increasing to 13 in Daulathabad, which is an average of nearly 6 tractors per habitation. All habitations have pump sets, ranging from 5 in Gundlappally to 250 in Gokafasalabad, the average being 112 pump sets per habitation. There are 13 power sprayers and 13 threshers in 6 villages, but no seed drill in the study area. In Anantapur, 14 out of 16 habitations have tractor, while 15 habitations have pump sets and 5 habitations have power sprayers.

Agricultural infrastructure: In Mahaboobnagar, these include flour and grinding mills, rice mills, oilseed crusher, storage go-downs, milk collection centers and food processing units. As these are basically higher order units, very few habitations in the study area possess them. For example a rice mill is available in two habitations and storage go-down only in one habitation. Milk collection centers and flour and grinding mills are reported to be available in a larger number of habitations. However there are no oilseed crushers and food processing units in the entire study area and hence farmers have to travel to neighboring villages for these services. Anantapur, on the other hand, has a few milk collection centers and flour and grinding mills.

LIVESTOCK

Sheep and goat constitute 72% of the total livestock population (cows, buffaloes, goats, sheep and draught animals) in the project villages of Mahaboobnagar district; while in Anantapur district sheep and goat together constitute 83 % of the livestock population (Table 2.6).

²⁰ Strictly speaking, the best denominator for working out these ratios is with respect to the population dependent on agriculture and not with respect to general population, but the former number is difficult to obtain.

Table 2.6: Livestock ownership by households

Type of livestock	Number of animals	Households owning animals		Average number of animals per household
		Number	% of total	
OVERALL				
Cows	3186	687	7	5
Buffaloes	1,800	928	10	2
Goats	7,608	755	8	10
Sheep	21,137	815	9	26
Draught animals	4,867	2,079	22	2
Poultry	33,656	4353	45	8
MAHABOBNAGAR				
Cows	2,660	340	4	8
Buffaloes	1,205	626	8	2
Goats	5,485	555	7	10
Sheep	15,271	169	2	90
Draught animals	4,364	1,832	23	2
Poultry	28,985	3,522	44*	8
ANANTAPUR				
Cows	526	347	23	2
Buffaloes	595	302	20	2
Goats	2,123	200	13	11
Sheep	5,866	646	43	9
Draught animals	503	247	16	2
Poultry	4,671	831	55	6

Nearly half the households (45%) own poultry birds, followed by bulls (in 22% of households), buffaloes (10%) and finally small ruminants (sheep and goat). The large average number of sheep per household (26) is typical since rearers tend to keep large flocks of sheep and goats (Table 2.5).

MIGRATION

At the aggregate level, about 15% of the households in the project villages migrate, although the proportion is higher (20%) in Anantapur district (Table 2.7).

Table 2.7: Migration

Type of migration	Households in Anantapur		Households in Mahaboobnagar		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Long term (> 6 months)	58	18%	386	35%	444	31%
Seasonal (up to 3 months)	12	4%	308	28%	320	22%
Short term (4 – 6 months)	211	68%	137	12%	348	25%
Daily commuters to near by towns	30	10%	279	25%	309	22%
Total	311	100%	1110	100%	1421	100%

The most common form of migration was ‘long term migration, with 31% of migrant households reporting such migration. The other three streams reported were ‘seasonal migration’ and daily commuters (22% each), and short- term migration (25%). Of the 1,110 migrant households in Mahaboobnagar, around 35% migrate for long term, while 28% migrate seasonally and 25% as daily commuters. In Anantapur, however, short term migration is the most common (68% of households), followed by long term migration (19%).

VILLAGE INSTITUTIONS

The institutional membership of the households in the project villages is an indicator of their relationship with different institutions and access to services. The most important institution in the project villages is the self-help group (SHG), consisting of 10-15 women from the village. Hence, the number of households organized into SHGs in villages is directly proportional to the population of these villages. The villages with the highest number of SHGs are those with a population of more than 200 households (Table 2.8).

Table 2.8: Proportion of households organized into SHGs

Size of habitation (households)	Number of members in SHGs			Percentage to total
	Anantapur	Mahaboobnagar	Overall	
< 50	78	45	123	2%
51-100	588	179	767	13%
101-150	256	373	629	11%
151-200	374	192	566	10%
> 201	712	3078	3790	65%
Total	2,008	3,867	5,875	100%

In some villages, there are more SHG members than households, e.g., 10 villages of Anantapur and 3 villages of Mahaboobnagar district, implying that some households in each of these villages have more than one member in an SHG, a situation more common in SC and ST households.

After SHGs, farmer groups – called *Rythu Mitra* Groups (RMGs) – are most numerous in the study villages (Table 2.9). Though GoAP had promoted RMGs in large scale, at present they are defunct in the majority of project villages. Youth Clubs were present only in 5 villages of Mahaboobnagar district. Watershed committees and *Vana Samrakshana Samitis* (VSS) exist in some of the project villages.

Table: 2.9. Distribution of institutions found in the pilot villages surveyed

Institution	Anantapur	Mahaboobnagar	Total
Self-help groups	156	291	447
<i>Rythu Mitra</i> Group (Farmers’ group)	8	35	43
Youth Clubs	0	6	6
Watershed Committees	6	12	18
<i>Vana Samrakshana Samiti</i> (Joint Forest Management Committees)	4	8	12
Total	174	352	526

ACCESS TO FACILITIES

Distance to nearest town: In Mahaboobnagar district, on average, a study habitation is 6 km away from the nearest town, although the actual distance varied considerably: one habitation is more than 10 kms away, while 10 habitations are within 3-10 kms (Table 2.10). In Anantapur, all the 16 habitations covered by the study are around 5 kms from the nearest town, the range being 0.5 to 12 kms.

Table 2.10: Classification of villages based on distance from near by town

Distance (Kms)	Anantapur	Mahaboobnagar	Number	Percentage to total
Less than 3	4	3	7	23
3 – 5	5	1	6	20
5 -10	7	9	16	53
10 & above		1	1	3
Total	16	14	30	100

Access to government programs: Out of about a dozen schemes operating in the study area, APREGS was the major employment program in terms of access to the households in the project villages (Table 2.11).

Table 2.11: Access to government programs

Programs	Anantapur	Mahaboobnagar	Total	Percentage
<i>Indira Awas Yojana</i>	798	3202	4,000	42
APREGS	No data	4450(adjusted)	4,450	46
<i>Indira Kranti Patham (IKP)</i>	396	987	1,383	14
Watershed programme	317	813	1,130	12
Old age pension	399	1327	1,726	18
Widow pension	260	700	960	10
Disability pension	83	211	294	3
Joint Forest Management (JFM)	158	17	175	2
<i>Prime Minister Rozgar Yojana</i>	6	8	14	0.1
<i>Rajiv Yuva Sakthi</i>	0	5	5	0.05

Note: Percentages are calculated out of the total of 9589 households surveyed.

Besides APREGS, *Indira Aawaas Yojana* (a housing scheme for the weaker sections) provided benefits to a large number of households (417 for every 1000 households in the study area), followed very distantly by ‘old age pensions’ (180) and IKP (144 households). Schemes like the Prime Minister’s Rozgar Yojana (PMRY) and the Rajeev Yuva Shakti cover only a large number of households.

In Mahaboobnagar, *Indira Awaas Yojana* was the major government development programme covering about 40% of the households surveyed, distantly followed by old age pensions (16%), Indira Kranthi Patham (12%), watershed development programs (10%) and widows pensions (9%). In Anantapur, the major programs found in the surveyed villages are the old age pensions, Indira Awas Yojana, Indira Kranthi Patham, watershed programmes, widows pensions, Community Forest Management (CFM) and Joint Forest Management (JFM) and disability pensions. Interestingly, the pension scheme has come to the rescue of disadvantaged groups who were dependent earlier on parents or elders.

Operations of NGOs: In Mahaboobnagar, NGOs are working in the fields of micro-credit and livestock, NRM, fishery and child labor, while NGOs in Anantapur work mainly in health and education, NRM activities, drinking water and micro-finance.

HUMAN STRESS

Stress is taken to be manifested in the form of scarcity, shortage and distress. In general people in rain-fed areas are vulnerable to stress. Table 2.12 shows the nature of stress faced by different livelihood groups in the project villages.

Table 2.12: Stress faced by different livelihood groups

Livelihood group	Number of villages by type of stress					
	Scarcity		Shortage		Distress	
	Anantapur	M'nagar	Anantapur	M'nagar	Anantapur	M'nagar
Landless	5	7	2	5	8	1
Small & marginal farmers	5	4	0	4	11	6
Goat rearers	7	8	8	2	0	3
Sheep rearers	7	7	6	6	3	1
Women headed households	3	8	6	4	6	1
Craftsmen	2	2	8	1	1	7

Stress due to scarcity was reported in more than half of the villages in Mahaboobnagar and quarter villages in Anantapur district. In a majority of villages of Mahaboobnagar district women headed households were facing scarcity. As regards to the stress due to shortage and distress is higher in Anantapur district. Craftsmen seem to have most effected due shortage related stress. However the craftsmen in Anantapur experience much more shortage than their counter parts in Mahaboobnagar. Small and marginal farmers, in about half of the villages in both the districts, had reported facing distress. Interestingly landless households in more villages reported distress. However the craftsmen in Mahaboobnagar experienced much more distress than their counter parts in Anantapur.

COPING STRATEGIES

People in the project villages have been adopting various strategies to overcome stress. The major strategies as informed by the respondents are reducing the quantity and number of meals, sale of assets, working as an attached labour with the large farmers, borrowing money from others, migration and participating in AP-REGS. However these strategies vary across the different livelihood groups and at different time points (Table 2.13).

The landless and women headed households, used to reduce the quantity and frequency of food in take in the past in both districts. In recent years, they started depending more on AP-REGS and to some extent availing loans from both formal and informal institutions. The landless households have been continuing their practice of migrating to urban areas to work as labourers.

Table 2.13: Coping strategies adopted by different livelihood groups

Livelihood groups	Anantapur		Mahaboobnagar	
	Past	Present	Past	Present
Land less	Reducing quantity of meals Migration Working as attached labour	AP-REGS Borrowing	Reducing quantity of meals Working as attached labour Borrowing Migration	AP-REGS Migration Borrowing
Small and marginal farmers	Borrowing Sale of assets Reducing quantity of meals	AP-REGS Migration Borrowing	Sale of assets Borrowing Reducing quantity of meals	Borrowing AP-REGS Sale of assets
Goat rearers	Sale of assets	Sale of assets Borrowing Migration	Sale of assets Borrowing	Sale of assets Borrowing
Shepherds	Sale of assets Migration	Migration Sale of assets	Sale of assets Migration	Migration Sale of assets Borrowing
Women	Reducing quantity of meals Borrowing	AP-REGS Borrowing Attached labour Sale of assets	Reducing quantity of meals	Borrowing AP-REGS Sale of assets Reduce quantity of meals
Craftsmen	Borrowing Reducing quantity of meals	Borrowing Migration	Borrowing Reducing quantity of meals Migration Sale of assets	Borrowing Migration

The small and marginal farmers and craftsmen used to borrow money or sell their assets in the past. They are now employing themselves in AP-REGS; and some of them are also migrating to other places in search of livelihoods. The craftsmen have been continuing the practice of borrowing, as they could not engage in AP-REGS. As regards to goat and sheep rearers, they used to sell some portion of their flock as an immediate measure to coping with the stress. Though they used to resort to migration the magnanimity seems to be low. At present, they practice migration as a major coping strategy rather than simply disposing the flock. The changes in coping strategies among different livelihood groups were primarily due to welfare measures taken up by the government in the last two decades.

BASELINE SITUATION INDICATORS

A number of indicators have been defined to measure progress from the baseline situation (Table 2.14).

Table 2.14: Generic Baseline Indicators

Indicator	Mahaboobnagar	Anantapur	Overall
% BPL households	41	34	40
Number of women headed households	1055	185	1240

Indicator	Mahaboobnagar	Anantapur	Overall
% of landless	2	14	3
% of marginal farmers	27	23	27
% of small farmers	54	40	53
% of medium	14	20	15
% of large	3	3	2
% of households having cows	4	23	7
% of households having buffaloes	8	20	10
% of households having goats	7	13	8
% of households having sheep	2	43	9
% of households having bulls	23	16	22
% having Poultry	44		53
Migration	1110	311	1421
Ground level	240	120	110

Apart from these generic indicators, pilot specific indicators have been developed which are described in subsequent chapters.

CHAPTER 3: AGRICULTURAL PRODUCTION

INTRODUCTION

This chapter discusses five pilots seeking to improve agricultural production systems in rain-fed areas: (1) diversified farming systems; (2) plough bullocks; (3) seed bank; (4) system of rice intensification (SRI) and (5) leased land farming. Following a brief description of each pilot, the nature of the baseline study carried out is described, followed by the findings of the baseline study. The description of each pilot comprises the context and rationale of its formulation, activities and practices proposed, process to be followed, result areas and indicators and the number of pilot participants. The description of the baseline study contains the sample of stakeholders consulted for the baseline study, the methodology used to collect information and the baseline study period. The findings comprise the socio-economic background of the sample surveyed, production characteristics, the baseline value of indicators including activities and practices being followed currently and economics of the activity, and existing government programs on issues concerning the pilot.

DIVERSIFIED FARMING SYSTEMS (DFS)

THE PILOT

Context and Rationale: Farmers in rain-fed areas are vulnerable to recurrent risks due to rainfall variability, degrading soil conditions, low yields and weak economic resources. Productivity in these areas is low due to various factors:

- Soil degradation: Declining organic matter in soils, largely due to the indiscriminate use of chemical fertilizers, is leading to deteriorating soil health. Also, considerable soil along with valuable nutrients is lost because of erosion from sloping and undulating land.
- Reduced soil moisture: Reducing infiltration of rain water due to hardening of soil. Also, the low organic matter in soils reduces moisture holding capacity of soils and aggravates the problem of soil hardening.
- Reduced biomass in soil: The practice of biomass incorporation into the soil has reduced due to lack of trees and shrubs around the field, and the non-availability of labour to collect and incorporate the biomass into soils.
- Low potency of manure: The practice of burning crop residues leads to huge loss of nutrients that would otherwise be used to produce manure. Manure produced using the heap method has less nutrients due to the absence of biomass and the uneven decomposition of organic matter.

In order to re-introduce sustainable practices to overcome these constraints in semi-arid areas and thereby to improve productivity and help combat climate adversities, APDAI launched a pilot project called Diversified Framing Systems (DFS).

Activities and Indicators: The DFS pilot aims to improve the fertility, soil moisture holding capacity and nutrient-use efficiency of soils and thereby improve the diversity and productivity of rain-fed rain fed crops and minimize risks associated with drought. Following discussions with individual farmers, interventions appropriate to each farmer’s fields are introduced in a participatory manner so as to increase farmer participation and ownership. The interventions fall under five major categories, crop diversity, soil fertility management, biomass incorporation, plantations and erosion control measures, each of which has several constituent practices (Table 3.1). Linkages with APREGS are also proposed as part of a plan to make labor supply to DFS institutionally sustainable.

Table 3.1: Activities, Practices and Indicators for the DFS Pilot

Activity	Practices promoted	Indicators
Crop diversification	<ul style="list-style-type: none"> ▪ Promoting intercrops and inter-cultivation 	<ul style="list-style-type: none"> ▪ Number of farmers who ploughed or spread intercrops.
Soil fertility management	<ul style="list-style-type: none"> ▪ Digging one compost pit per acre ▪ Planting glyricidia seedlings around pit to provide biomass for composting and reducing labour in the collection of biomass ▪ Mulching and applying biomass compost to fields ▪ Applying tank silt to improve physical condition ▪ Adding minerals to soil ▪ Spraying liquid manures such as <i>panchagavya</i>, <i>amruta jalam</i> and vermiwash²¹ to rectify nutrient deficiency, if any 	<ul style="list-style-type: none"> ▪ Number of farmers who applied compost ▪ Average number of days for which crop survived without rain (proxy) ▪ Average crop-wise yield per acre ▪ Average net income per acre of land
Plantations	<ul style="list-style-type: none"> ▪ Planting multipurpose tree species that provide biomass for direct in-field incorporation and to meet fruit, fodder and fuel requirements of family 	<ul style="list-style-type: none"> ▪ Number of farmers growing tree and fodder crops ▪ Increase in livestock population (proxy)
Erosion control	<ul style="list-style-type: none"> ▪ Laying earthen bunds across the slope to prevent soil erosion, runoff and loss of valuable nutrients. 	<ul style="list-style-type: none"> ▪ Number of farmers who have taken up soil-moisture conservation measures
Accessing farm labor for DFS activities	<ul style="list-style-type: none"> ▪ Drawing local farm labor through AP REGS 	<ul style="list-style-type: none"> ▪ Number of farmers who accessed support from AP REGS

Process: In both districts, DFS pilot activities were divided into two phases. In the first phase, individual farmers were selected from project villages to take up one or more pilot activities. In the second phase, the focus shifted from individual farmers to groups of farmers operating large areas of farm land. Thus Phase 2 aimed at creating a critical mass of farmers in each of the project villages and thus the enabling conditions for natural replication of various practices. Consequently, 250 ha of area were selected in each of the DFS pilot villages to implement various DFS practices based on the needs of individual farmer’s fields. The farmers in the selected area were also organized into smaller common interest groups (CIGs).

²¹ *Panchagavya* is prepared by fermenting mixture of cow urine and dung, curd, *jaggery* and water for six days. Similarly, *Amruthjalam* is prepared by fermenting cow urine and dung, green gram or black gram in water. Vermiwash is produced by dissolving vermi compost in water.

Sample: A total of 1,754 farmers in 27 villages have been covered under the DFS pilot, of whom three-fourths are from Mahaboobnagar district, where the project has been operating since 2006 (Table 3.2).

Table 3.2: Farmers and villages coverage under DFS across the districts

	Villages in which DFS pilot is functional	Number of farmers covered
Mahaboobnagar	14	1293
Anantapur	9	461
Across the project	23	1,754

BASELINE STUDY

Sample: For the purpose of the baseline study of the DFS pilot, a total of 68 farmers were surveyed, comprising the three best framers selected from each village in consultation with the VO and the APDAI team. Of the total sample of farmers, 41 are from Mahaboobnagar and 27 from Anantapur district (Table 3.3).

Table 3.3: Farmers surveyed in the baseline sample

	Number of farmers surveyed in the baseline study	% of surveyed to Total farmers
Mahaboobnagar	41	60%
Anantapur	27	40%
Overall	68	100%

Baseline period: This was taken to be kharif 2006 for 24 farmers in Mahaboobnagar who began pilot activities from kharif 2007. For the 17 farmers from Mahaboobnagar and the 27 farmers from Anantapur who began pilot activities in kharif 2008, the baseline period was kharif 2007.

Methodology followed: Given the large number of farmers in the pilot only the three ‘best’ farmers were selected in each village and information collected using a specially-designed format (see Appendix 4). Focus Group Discussions (FGD) were held with selected DFS farmers to gather information on cultivation practices and baseline value of indicators.

BASELINE FINDINGS

Socio-economic background of the farmers

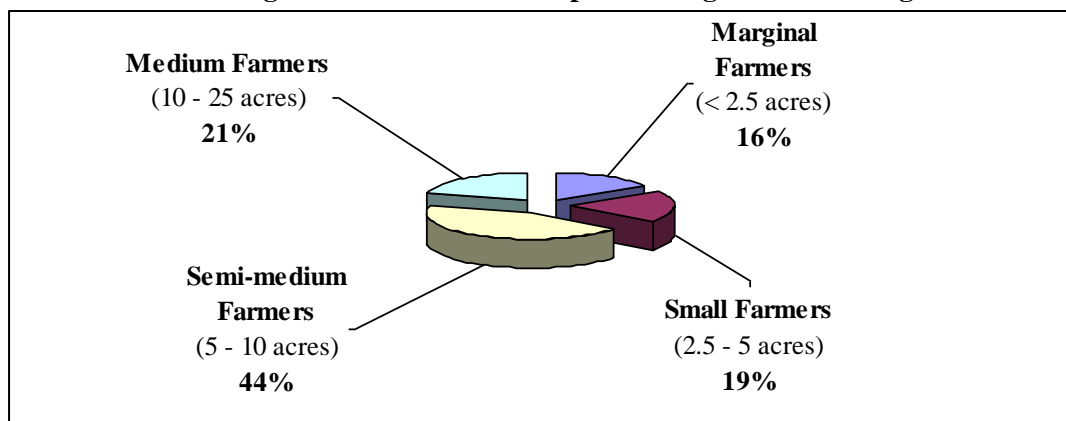
- **Most farmers surveyed are socially backward:** Around 70% of the farmers in the sample are from Backward Castes (BC) Scheduled Castes (SC) and Scheduled Tribes (ST)²².

²² The Government of India (GOI) has officially documented castes and sub-castes, primarily to determine those deserving reservation (positive discrimination in education and jobs) through the census. GOI has broadly categorized castes into Scheduled Castes (SC), Scheduled Tribes (ST), (Other) Backward Classes and Other Castes (OC). SC generally consists of former "untouchables" (the term ‘Dalit’ is now preferred), ST generally consist of tribal groups, BC consist of a number of castes with a higher social status than SC while OC are those

There are, however, variations across the districts: a larger proportion being socially backward in Mahaboobnagar than Anantapur (Table B1 in Appendix 6).

- **Most farmers surveyed are illiterate or semi-literate:** Overall, more than half the sample farmers are either illiterate or semi-literate, but the proportion of literate varies from 50% in Anantapur to 22% in Mahaboobnagar (Table B2 in Appendix 6).
- **Most dry-land farmers have irrigated land also:** As many as 54 out of the 68 dry-land farmers in the sample (or 79%) have irrigated land in addition to dry land. Only 21% have only dry land, and most of these are lower caste farmers (Table B3 in Appendix 6)
- **Upper caste farmers have slightly more irrigated land:** The proportion of irrigated to total land for sample farmers varies from 20% for lower caste (BC) and 31% for upper caste farmers, the average for all the households being 26% (Table B3 in Appendix 6)
- **Most farmers are not small or marginal farmers:** Nearly a third (65%) of farmers in the sample own at least 5 acres of land and are thus at least ‘semi-medium’ according to the official classification (Figure 3.1; see also Table B4 in Appendix 6).²³ Only one in six is a marginal farmer. There are no large farmers in the sample

Figure 3.1: Land ownership according to land holding size



Production characteristics

- **Red soil is the predominant type in both the districts.** Both in terms of the total holdings and extent of land owned by the farmers, red soil is the predominant type (41 %), followed by black soil (31 %) and sandy soil (18%). In Mahaboobnagar, however, 32% of the land owned by sample farmers has sandy soil, while 31% is red soil and 23% is black soil (23%). In Anantapur, however, more than half the land owned by sample farmers (53%) is red soil, followed by black soil (Table B5 in Appendix 6).
- **Low soil fertility is a common problem in both districts:** Overall, about 10 % of the total holdings have either salinity (7%) or alkalinity (3 %) problems. More holdings in Anantapur had salinity problems (Table B6 in Appendix 6).
- **Less than half the holdings had a source of irrigation:** Overall, only 69 of 151 holdings owned by sample farmers had an irrigation source (Table B7 in Appendix 6). In Mahaboobnagar, only 41% (34 out of 82) of holdings owned by sample farmers have an irrigation source, while the proportion is 50% (35 out of 69) in Anantapur.

are socially better off communities. SC and BC are collectively known as lower castes and OC as the upper castes.

²³ This is the classification adopted under the Drought Prone Area Programme (DPAP) of the GOI.

- **Bore wells are the major source of irrigation:** Both in terms of average and total irrigated area the major source of irrigation is bore well, followed by open wells and tanks (Table B7 in Appendix 6). In Mahaboobnagar, more than three-fourths of irrigated area in the district is under bore wells, the rest being under tanks (16 %) and open wells (8%). Even in Anantapur, bore wells are the major source of irrigation (67%), followed by open wells (25%). Only a few farmers have land irrigated by tanks or springs. But both bore wells and tanks are undependable sources because of unpredictable and inadequate rainfall during drought years.
- **Most households own bullocks:** Overall, three-fourths of the sample farmers have bullocks and bulls, more than half (57%) have cows and poultry, a quarter have buffaloes, and smaller proportions (7-13%) own small ruminants (Table B8 in Appendix 6). Farmers sampled in Anantapur, however, had more cows and poultry than those surveyed in Mahaboobnagar.
- **Most farmers use own bullocks for ploughing:** Only a small proportion of sample farmers use either hired bullocks (19%) or tractors (7%) for tilling the land (Table B9 in Appendix 6). More sample farmers in Mahaboobnagar use hired bullocks (22%) than in Anantapur (15%).
- **Paddy is a major irrigated crop and groundnut and redgram the major rain-fed crops:** The major irrigated crops grown in Anantapur include paddy, sunflower, groundnut, floriculture, sericulture and vegetables, while crops grown under rain-fed conditions include red gram, ground nut, sunflower and maize (Table 3.3).

Table 3.3: Major crops grown by sample farmers

District	Kharif crops	Rabi crops	Summer crops
Mahaboobnagar	Red gram, Paddy, groundnut, Jowar, Sesame, Black gram, green gram, ragi, and maize	Paddy, horse gram, groundnut and Jowar	Vegetables
Anantapur	Sunflower, paddy, groundnut, sericulture, tomato, cotton, flowers, maize and red gram	Sunflower, paddy, groundnut, Vegetables, Maize, Jowar, ragi, flowers and Bajra	Vegetables

Sample farmers in Mahaboobnagar district primarily grow paddy and sweet oranges under irrigated conditions. A variety of crops are grown under rain-fed conditions, including red gram, black gram, green gram, jowar, maize and ragi, depending on the extent of land owned and climatic conditions. In the event of crop failure due to long dry spells and inadequate rainfall, white jowar and horse gram are sown in September and early October. In Anantapur, on the whole, there is a heavy concentration on paddy among irrigated crops and red gram and groundnut among rain-fed crops.

Baseline status of indicators

In spite of poor soil conditions, smallholders in dry land areas increase soil fertility through choice of cropping pattern that include legumes and green manure crops. Besides cropping pattern, practices such as the crop rotation, inter-cropping, application of chemical fertilizers and pesticides including use of NPM are also examined to determine the existing use of various practices by the sample farmers. These practices are examined only with reference to the area covered under DFS to understand whether farmers are following practices which promote soil fertility and diversity in farming.

- **Soil nutrient enhancement:** To improve soil nutrient content, farmers apply farm yard manure, green manures and occasionally other soil amendments²⁴. At aggregate level 43% of farmers were growing inter-crops with slightly more farmers practicing in Mahaboobnagar district. Very few farmers in both the districts are propagating green manure in the soils.
- **Intercropping:** Overall, about 43 % of sample farmers were practicing inter-cropping (Table 3.4). More farmers practiced intercropping in Mahaboobnagar (46%) than in Anantapur (37%). Farmers in both districts are primarily growing intercrops to harvest the crop and not to use it as a green manure to enhance soil fertility. Very few farmers were ploughing or spreading of inter crops as part of propagating green manure in the soils (Table B10 in Appendix 6).

Table 3.4: Crop management practices

Practice	Mahaboobnagar		Anantapur		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
Inter-cropping	19	46%	10	37%	29	43%
Crop rotation	25	61%	22	82%	47	69%

- **Crop rotation:** As Table 3.4 shows, around 69% of the overall sample of farmers practice crop rotation, but much more in Anantapur (82%) than in Mahaboobnagar (61%). It appears that intercropping and crop rotation are practiced mostly by farmers with relatively larger holdings.
- **Soil and moisture conservation:** Farmers with land less-suited to cultivation are able to overcome productivity constraints through a variety of techniques. However, overall, sample farmers employed soil and moisture conservation (SMC) measures in only 21% of the total area owned by them to control soil erosion and increase infiltration of rainfall. More farmers in Anantapur (36%) were practicing SMC than in Mahaboobnagar (7%).
- **Bund plantations:** Farmers have also planted trees along the bunds to stabilize them and to provide vegetative material either for fodder or fuel wood. But only 36% of the land owned by the sample farmers had trees (Table B11 in Appendix 6). Slightly more (69%) of sample farmers' land in Mahaboobnagar had trees along the bunds than in Anantapur (46%). This is surprising given the investments that have gone in to watershed programs in these two districts.
- **Most farmers use chemical pesticides:** All the farmers in Mahaboobnagar district and about 55% of farmers in Anantapur district have applied chemical pesticides, giving a proportion of 82% for the entire sample (Table B12 in Appendix 6). In Anantapur, about 44% of sample farmers have applied only chemical pesticides, while 11% of farmers used chemical fertilizers in combination with botanical extracts. Furthermore, two of the farmers have applied only botanical extracts. The analysis also revealed that 37 % of farmers (engaged in groundnut farming) did not apply any pesticides, as there was no pest attack on the crop. In Mahaboobnagar, only a few farmers (17%) have followed non-pesticide management (NPM) techniques. Thus, even though efforts were made under Indira Kranthi Patham (IKP) to promote the NPM in these villages, 83% of sample farmers have exclusively depended on chemical pesticides for pest management. .

²⁴ Soil amendment is a material added to soil to improve plant growth and health. Lime is used to make soil less acidic. Fertilizers, such as farm yard manure and compost add depleted plant nutrients. Materials such as clay, will make soil hold more water. Gypsum releases nutrients and improves soil structure.

- **Labor support from EGS:** No farmer obtained agricultural wage laborers through APREGS.
- **Crop yields:** The average yield per acre is 2.58 quintals in the case of red gram, 2.95 quintals for *jowar*, 3.9 quintals for groundnut and 13.17 quintals for paddy (Table 3.6). Sample farmers retained more than 45% of paddy production and 25-33% of groundnut, *jowar* and red gram output for household consumption.

Table 3.6: Average yield of the crops per acre

Crop	Yield (Quintals)	Quantity produced (Quintals)	Quantity sold (Quintals)	% production retained for home consumption	Price per Quintal (Rs.)
MAHABOBNAGAR					
Groundnut	3.90	4	3	25%	1,717
Jowar	2.95	3	2	33%	772
Paddy	13.17	13	7	46%	606
Red gram	2.58	3	2	33%	1,911
ANANTAPUR					
Groundnut	3.04	3	2	33%	1,918

- **Crop Economics:** An important outcome indicator of DFS is increase in crop yields because of improved soil fertility. It is, therefore, important to calculate crop economics by examining expenditure on various agricultural operations, revenue and net income per acre of land. *Kharif* is the major season of crops and it contributes to 70 % of agricultural production while the remaining 30 % comes from the *rabi* season. Overall, for *kharif* crops grown by sample farmers in the baseline period, the average revenue is around Rs. 8,000 per acre with costs of around Rs. 5,500, which yields net revenue of around Rs. 2,500 per acre (Table 3.5). Sample farmers in Mahaboobnagar realized higher net revenues of around Rs. 3,000 per acre on average, while farmers in Anantapur earned only around Rs. 2,000 per acre, despite higher revenues per acre. This implies that there is a need to reduce cost of cultivation in Anantapur and improve revenue, either by increasing crop yields or by effectively improving the prices received by farmers. It remains to be seen if the DFS pilot interventions will increase the net profit per acre of land in both districts. For, only if this happens will there be an incentive for farmers to continue with the DFS interventions.

Table 3.5: Average income per acre of land for sample DFS farmers

	Mahaboobnagar	Anantapur	Overall
Average expenditure per acre (Rs.)	4,236	6,301	5,368
Average revenue per acre (Rs.)	7,232	8,281	7,756
Average net income per acre (Rs.)	2,996	1,981	2,488

A summary picture of baseline values of indicators for the DFS pilot is in Table 3.6.

Table 3.6: Baseline status of DFS pilot indicators

	Baseline Status		
	Mahaboobnagar	Anantapur	Overall
% of sample farmers growing intercrops	46	37	43
% of total area with trees	68	45	36
% of sample farmers with fodder crops	0	0	0

	Baseline Status		
	Mahaboobnagar	Anantapur	Overall
% of sample farmers who applied compost	0	0	0
% of sample farmers who ploughed back or spread intercrops	14	1	7
% of cultivated land with SMC measures in place	6	35	21
% of sample farmers who got free farm labor thru APREGS	0	0	0
Average net income per acre of land (in Rs.)	2,996	1,981	2,488

Supportive government programs

- The Department of Agriculture focuses on crop based extension system; and delivers extension services through Agriculture Officer (AO) and Extension officers. The ratio of AO to farmers, however, is substantially low and as a result, services are not reaching the farmers. Extension is more focused on delivering the inputs such as seeds, fertilizers, etc at subsidized rates. Agriculture development is not meeting needs of individual farmer and problems in his/her farm.
- The Department of Agriculture supplies seeds at subsidized rates to farmers, who submitted applications through line department officials. Inputs such as seeds and fertilizers are inadequate to meet the demand of farmers in the villages. Small and marginal farmers and rain-fed areas are always neglected from support provided by Agriculture Department.
- The activities related to biomass development (through bund plantations, block plantation) and SMC works are implemented through APREGS programme only in the fields of selected farmers (SC, ST, IAY beneficiaries only).
- The Department of Rural Development implements the national watershed development projects, which focus on soil and moisture conservation measures and agriculture productivity in dry land areas.

PLOUGH BULLOCKS

THE PILOT

Context and Rationale: Livestock forms an integral element in dry land production systems. Farmers essentially require draft animal power, making plough bullock ownership more of a necessity. Plough-bullocks are essential for agriculture. Accessing plough bullocks has been a major constraint for many of the poor farmers. So, they depend on hired bullock labor. This often results in delayed sowing and poor crop yields or leaving the land fallow. For the poor farmers it is difficult to purchase and manage plough-bullocks on their own, as the total demand for bullock labour in a year is low and highly seasonal. As a result, the farmer's indebtedness increases with each transaction. There are instances where small farmers after purchasing bullocks landed into indebtedness - as they were forced to sell animals at a cheaper rate for lack of fodder. As a consequence, there is an informal ban on lending for plough bullocks within the mainstream poverty alleviation programs. In effect, the constraint of plough bullocks remained unattended and is one of the main reasons for poor crop yields. In the APDAI villages, about 20% of farmers do not own any draught animals. In view of

this, plough-bullock pilot was taken up under APDAI to help the farmers complete farming operations in time.

Activities and Indicators: The pilot aims at creating a facility for the poor in the village, where their lands will be ploughed on a priority basis. Bullocks are purchased by VO and provided on annual hire basis to the farmers those who do not own bullocks. The bullocks would be operated by an individual on a commercial basis. Eventually, it is hoped that such a facility could be established under APREGS as a public service for poor farmers' land development. The practices of pilot and impact monitoring indicators are given in the table below.

Table 3.7: Activities, Result Areas and Indicators for the Plough Bullock Pilot

Activities	Result areas	Indicators
Plough bullocks are purchased by Village Organisation (VO) and provided to selected members for annual hire basis (@ 2500 pa – to be paid in three instalments) The agreement is for one year. Contract will be extended on year to year basis based on performance Membership in fodder bank	Increase in access to plough bullocks Profits from hiring out plough bullocks	Number of farmers who do not own plough bullock and are accessing services from this pilot Surplus of revenue over full costs of hiring out bullocks, season-wise Number of farmers who completed agriculture operations in time

Process: The small and marginal farmers without bullocks are selected. Village Organization (VO) purchases bullocks by involving the purchase committee (formed for this purpose). Each of the selected members gets a pair of bullocks for annual hire basis (@ Rs. 2500 per annum, to be paid in three installments. The agreement is for one year, which will be extended on year to year basis based on the performance. The selected members will also be enrolled as members in the fodder bank.

BASELINE STUDY

Sample: All participants of the plough bullock pilot, viz., 22 farmers from 9 villages in Mahabobnagar were interviewed (Table 3.8).

Table 3.8: Farmers and villages coverage by the plough bullock pilot

Village	Farmers covered	
	Number	Percentage
Bijjaram	2	9%
Bomraspet	3	14%
Chowdarpalli	3	14%
Doulatabad	3	14%
Gokafaslabad	3	14%
Muktipahad	2	9%
Nagrireddipalli	2	9%
Chennaram	1	5%
Lodipur	3	14%
Total	22	100%

Baseline period: This was taken to be July 2006 – June 2007, i.e., the agricultural year preceding the start of the pilot activities in the agricultural year July 2007 – June 2008.

Methodology followed: Focus Group Discussions (FGD) were held with all farmers that had hired plough bullocks as part of the pilot.

BASELINE FINDINGS

Socio-economic background of the farmers

- ***A majority of members supported under the pilot own land:*** In term of social composition of the sample members, seven members belong to scheduled caste and 15 members BC community. Further, in terms of literacy 27 percent of members studied up to primary level, while the rest of the members were illiterate.
- ***Most not involved in plough bullock labor previously:*** At least 14% (3 out of 22 members) were not engaged in bullock labor activity prior to this pilot. And it implies that they were neither had experience in the activity nor depended on it for their livelihood in the past.
- ***A third of households surveyed owned bullocks prior to the project:*** About 36% (8 out of 22) of the members had possessed bullocks prior to the pilot. These members were using bullocks both for their own farming operations as well as hiring out bullock labour. Further analysis revealed that only 23 % (5 out of 22) of the members were hiring-out bullock-labor during the baseline period.
- ***Greater dependence on hiring bullock labor:*** In the case of 9% of members (2 out of 22), more than one family member was engaged in hiring-out bullock labor, indicating a relatively higher dependency on this activity.

Production characteristics

- As discussed above, 23 % of the members were engaged in hiring-out bullock labor to other farmers in the village. The average number of paid work days generated by each member from bullock-labor by these members during 2006-2007 was 16.
- During the same period, each member used bullocks for 21 days on average in their own fields. These members were perhaps provided bullocks under the pilot, as the bullocks existing with them are old.
- The discussion with the farmers, who were having bullocks revealed that they carried out agricultural operations in their own field with in a time. And those without bullocks could not take up timely agricultural operations, as faced with difficulty of hiring-in bullock labour as per scheduled of plan.

Baseline status of indicators

- The pilot is functional only in Mahaboobnagar, with the 22 members indicating an average income of more than Rs. 6,500 per member per year at the time of the baseline (Table 3.9).

Table 3.9: Baseline status of plough-bullock pilot indicators

Indicators	Baseline Status		
	Mahaboobnagar	Anantapur	Overall
% of farmers without plough bullock accessing services from this pilot	22	0	22
Average Income (in Rs.)/member	6670*	NA	6670
% of farmers reporting timely agricultural operations	8	NA	8

* Taking into account both hired-out days and own use

Supportive government programs

- Bullocks and carts were distributed to individual beneficiaries at subsidized rates under the Integrated Rural Development Programme (IRDP) in the early 1980s.
- In recent years, women Self-help groups have also started providing loans to members for the purchase of bullocks.

SEED BANK

THE PILOT

Context and Rationale: The most common problem encountered by the farmer is timely availability of quality seed. For farmers, good quality seed is the most essential input. Traditionally, the seed supply was based largely on farmers' own effort and on a series of informal contacts and relationships, all of which ensured necessary planting material for the coming crop season. The situation of the farmer has worsened with disintegration of local practices and heavy reliance on market supplied seed. As a result, the farmer has gradually neglected cropping practices such as intercropping due to the non-availability of seeds. The farmer also been encountered the following problems:

- Variations (and failure) in early monsoon-rains often results in loss of crops. Availability of seeds for the main crop and contingency crop becomes a serious constraint at that point of time
- Seeds of green manure/intercrops/fodder crops are generally not available locally in required quantities.

The existence of the SHGs and their federations provide ample opportunity and a foundation for developing institutional systems for seed. So, the seed bank pilot attempts to promote community based institutional system toward enhancing seed availability.

Activities and Indicators: Each VO will identify an entrepreneur for managing the seed bank. For procuring the seed, project will provide grant to the VO and VO intern provide fund to the entrepreneurs as revolving fund. The revolving fund will be interest free loan to the entrepreneurs to purchase the seed. At the initial phase, VO with the help of VA will estimate the seed requirement in each village. The information will be consolidated at mandal level; and accordingly seed will be procured either from the farmers or the market. Thus procured seed will be processed and distributed by entrepreneurs through marketing

persons, selected by VO and MMS. After crop harvesting, the seed will be collected in 1: 1.5 ratio from farmers (Table 3.10).

Table 3.10: Activities, Result areas and indicators of the Seed Bank pilot

Activities	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Estimating seed requirements of each village ▪ Identification and involvement of entrepreneurs in the management of seed bank ▪ Procurement of seed with financial support of MMS ▪ Supply and collection of entrepreneur through marketing agent at VO level 	<ul style="list-style-type: none"> ▪ Timely availability of seed to farmers ▪ Reduction in dependency on outsiders for seed ▪ Created infrastructure and seed storage facilities 	<ul style="list-style-type: none"> ▪ Number of farmers who obtained seed from the seed bank

Process: The process of managing the seed bank starts with the identification of entrepreneurs by VO. The criteria used for selection of the entrepreneur are members' experience in seed storage, processing and seed transactions, and willingness to spare time for the activity. Thus selected members will be oriented on seed bank system by arranging exposure visit to existing seed banks. As part of establishing seed, the entrepreneurs will open a bank account and identify storage room and procure storage infrastructure (e.g., storage bins, weights and measures, seed treatment and packing material, drying mats etc) with the support of VO. VA will support the entrepreneur in maintaining a stock register and records of seed transactions. It may be noted that in practice VO will procure and distribute the seed in the first round. The entrepreneur will come into action only in second round. This was pattern followed in both the districts.

Sample: One seed bank has been established per mandal in both Mahaboobnagar (3) and Anantapur (2) districts.

BASELINE STUDY

Sample: The sample for the study comprises entrepreneurs involved in managing all the seed banks established

Baseline period: The baseline period in Mahaboobnagar was Kharif 2007 and for Anantapur district it is Kharif 2008.

Methodology followed: FGDs were held with selected farmers, VO leaders and identified entrepreneurs to gather information on the availability of and dependence on markets for seed.

BASELINE FINDINGS

Socio-economic characteristics of sample: Five entrepreneurs were selected in Mahaboobnagar for managing the seed bank. The seed banks in Doulatabad and Kosigi are managed by two entrepreneurs each, while it is managed by single member in Bomaraspet. All of them belong to Backward Caste (BC) and were illiterate - except one who studied up to upper primary level.

In the case of the Anantapur district, four members were selected to manage the seed banks at Veparala (Gandlapenta mandal) and Devireddipalli (Nallacheruvu). Thus, two members each are managing one seed bank. Of the four members, two members are from Other Castes (OC) and one each from BC and Scheduled Tribe (ST) category. All the members are literate – 2 members studied up to primary level, while others studied up to upper primary level.

Baseline status of indicators

- At the aggregate level, more than half of the farmers (57%) were saving seed from their farm, while one-fourth (25%) of the sample farmers, all from Anantapur, bought seeds from the research station of the Department of Agriculture (Table 3.11). The rest were buying seed from either the market (9%) or fellow farmers (9%).
- In Mahaboobnagar, a majority of the farmers depend on farm saved seed (73%) compared to only 33% of the sample farmers in Anantapur. But while 63% of sample farmers in Anantapur procure seed from research stations, none of the sample farmers did so in Mahaboobnagar.

Table 3.11: Procurement of seed

Source of seed	Anantapur		Mahaboobnagr		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
Own seed	9	33	30	73	39	57
Market	1	4	5	12	6	9
Research station	17	43	0	0	17	25
Fellow farmer	0	0	6	15	6	9

- Farm saved seed continues to be an important source for the farmers in the project villages. The farmers depend up on farm saved seed in the case of pulses²⁵ (70 %) followed by millets (60 %); and to a lesser extent for fodder (10 %), vegetables (20 %) and oil crops (35 %).
- Farmers borrow seed through *Nagu paddathi*²⁶ in the case of millets, pulses and inter crops; and for oil seeds like sunflower and sesame.
- Less than 10% of farmers depend on the Agriculture Department for seeds, given the limited support from government for fodder, vegetable and intercrop seeds.
- There is higher dependency on markets for oil seeds (56 percent), vegetables (80 %) and fodder seeds (90 %). There is higher dependency on market for groundnut. Farmers were procuring seed of pulses and millets to the extent of 27 and 21 % respectively of the total requirement from the market.

²⁵ Pulses are annual leguminous crops yielding from one to twelve grains or seeds of variable size, shape and color within a pod, according to the Food and Agricultural Organization of the United Nations (FAO). Pulses are important food crops due to their high protein and essential amino acid content. Like many leguminous crops, pulses play a key role in crop rotation due to their ability to fix nitrogen. Pulses are used for food and animal feed. Cereal crops or grains are mostly grasses cultivated for their edible bran or fruit seeds (i.e., botanically a type of fruit called a caryopsis). Worldwide, cereals are grown in greater quantities and provide more energy than any other type of crop; they are therefore staple crops. They are also a rich source of carbohydrates.

²⁶ In this method, a farmer borrows seed from the other farmer in the village and repays after harvesting crop in the rate of 1:1.5.

- There appears to be shortage of seed in the case of millets, pulses, oil seeds and fodder. Farmers seem to facing problems in accessing oil and fodder seeds timely.
- Castor seed production was taken up under APRLP in Doulatabad mandal. The activity was discontinued subsequently, as there was no follow-up.

Table 3.12: Baseline status of Seed Bank pilot indicators

Indicators	Baseline Status		
	Mahaboobnagar	Anantapur	Overall
% farmers using own seed	73	33	57
% farmers using seed bought from the market	12	4	8
% farmers using seed bought from research stations	0	63	63

Supportive government programs

- The seed is provided by the agriculture department on subsidised rates to the selected farmers.
- In the past department of Agriculture promoted seed banks and seed village concept. The programme was mainly focused on seed production on whole village concept and linking it with AP Seeds Corporation. However, fulfilling the local seed requirement was not focused. However, the activity failed to sustain due to lack of proper facilitation and follow-up.
- In watersheds seed banks were established. Lack of proper institutional arrangement to run the seed banks resulted in poor recovery of seeds that were supplied through seed bank.

SYSTEM OF RICE INTENSIFICATION (SRI)

THE PILOT

Context and Rationale: Rice cultivation is expanding under tanks and bore wells. Cultivation of rice has enhanced dependence on large quantity of surface and ground water. Scarcity of water is more common among farmers engaged in conventional water intensive (inundation) method of rice cultivation. Scarcity of water is more common among farmers engaged in conventional water intensive (inundation) method of rice cultivation. The ground water table has been falling at alarming rate. Hence, rice cultivation is unaffordable and unpredictable. This will have serious implications on food security in these areas. The APDAI is working with farmers to promote SRI, as it will reduce pressure on water and improve food production. The SRI which requires a fewer number of seeds and less nursery area, saves water and enhances the yield of rice.

Activities and Indicators: To improve rice production, mainstream technology options focus mainly on improved seeds, crop nutrition, and pest and disease control. The SRI, however, does not depend on such agronomic tactics, but emphasizes on comprehensive management of resources by changing the way land, seeds, water, nutrients and human labour are used for paddy cultivation. The activities include promotion of SRI under bore wells and tanks (Table 2.17).

Table 3.13: Activities, Practices and Indicators for SRI pilot

Activities	Practices promoted	Indicators
Organising rice-growing farmers under tanks and bore wells Providing training on skills related to SRI Supplying equipments (marker and weeder) or alternatively creating custom hiring centre	<ul style="list-style-type: none"> ▪ Managing water resources carefully Comprehensive management of resources such as land, seed, water and nutrients\	<ul style="list-style-type: none"> ▪ Number of farmers followed land, seed, water and nutrient management practices ▪ Reduction in seed and other input cost Increase in net income

Process: The SRI cultivation involves preparing high quality land, developing un-flooded nurseries, using young seedlings for early transplantation, transplanting single the seedlings singly, ensuring wider spacing between seedlings and weeding frequently. In addition, preference will be given to organic manure to synthetic fertilizers. An important aspect of SRI is managing water carefully so that the plant root zone is moist, but not continuously saturated. The difference between conventional rice cultivation and SRI are as follows:

Table 3.14: SRI Vs Conventional Methods of Rice Cultivation

Item	Conventional method	SRI method
Seed	50-60 kg/hectare	5kg seeds /hectare
Transplanting	Seedlings about 30 days' old	Seedlings of about 8-12 days' old
Number hills/sq.m	About 30-40 hills (clumps) are planted	About 16 hills
Number of seedlings/hill	Usually three or more seedlings are planted	Only one seedling
Fertilization	Application of chemical fertilizers, pesticides, herbicides and insecticides	Preference given to organic fertilization, non-chemical means of weed control; pesticides, insecticides usually not necessary
Water management	Continuous flooding	Only moist conditions
Weed management	Weeds manually removed from the field	Weeds turn down into the field by a weeder

BASELINE STUDY

Sample: For the purpose of the study of the SRI pilot, a total of 43 farmers were surveyed - 22 farmers from Mahaboobnagar district and 21 from Anantapur district. In each village the three best framers selected (where SRI was promoted by APDAI) in consultation with VO and APDAI team.

Baseline period: The baseline period for Mahaboobnagar district villages was *Kharif* 2006 (July-November) while it was *Kharif* 2007 for Anantapur district.

Methodology followed: The information was collected from the selected farmers using a specially-designed schedule.

BASELINE FINDINGS

Socio-economic characteristics of sample

The SRI was implemented in eight villages in Mahaboobnagar district and 10 villages in Anantapur district with the involvement of some of the farmers growing paddy under bore wells and irrigation tanks.

- Overall, more than half of the members are OCs, followed by BCs (30 %) and SCS and STs (7%). However, BCs emerged as a predominant group in Mahaboobnagar district.
- More than three-fourths of members are literate at aggregate level.

Baseline status of indicators

Majority of farmers use chemical pesticides: At the aggregate level 51% of the farmers were using only non-chemical pest management methods at baseline period (Table 3.15). Another 30% of the farmers were using a mix of 75% chemical and 25% non-chemical methods. In Anantapur, almost two-thirds of farmers were using 100% chemicals. It appears that on-third of the farmers in Mahaboobnagar were using more higher proportion of non-chemicals, implying that they are already have awareness on non-chemical approaches.

Table 3.15: Application of Chemical pesticides

Ratio of chemicals applied	Mahaboobnagar		Anantapur		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
100 % chemicals	7	32%	15	71%	22	51%
75% chemicals and 25% non chemical	8	36%	5	24%	13	30%
50% chemicals and 50% non chemical	3	14%	0	0%	3	7%
25% chemicals and 75% non chemical	2	9%	0	0%	2	5%
100% non chemicals	0	0%	1	5%	1	2%
No need for using pesticides	2	9%	0	0%	2	5%
Total	22	100%	21	100%	43	100%

Half the farmers procure seed from government programs: 22 the 43 sample farmers have accessed seed from the government. The trends are same in both the districts with three farmers from each district got seeds from the government. One farmer in Mahaboobnagar also got marker/weeder from government, implying that s/he is already involved in SRI.

None of the farmers received any training: The discussion with farmers in both districts revealed that none of the farmers have received extension and technical support from the government.

Crop economics: In Mahaboobnagar, the average yield per acre was nearly 15 quintals at baseline period. The expenditure incurred and revenue generate per acre is Rs. 7339 and Rs.11084 respectively. The net income per acre is Rs. 3746 (Table 3.16).

Table 3.16: Crop economics

Time period/ product		Yield/acre (quintal)	Price/ quintal	Revenue/ acre	Expenditure/ acre	Profit/ acre
Mahaboobnagar	Main crop	14.89	650	9680	7339	3746
	Byproduct	10.43	135	1404		

Supportive government programs: Department of Agriculture is encouraging farmers to take up SRI under bore wells and providing equipments such as markers and weeders. It covers a small area wherever farmers are showing willingness and interest; and oversees the implementation through agriculture extension workers and progressive farmers

LEASED LAND FARMING

THE PILOT

Context and Rationale: Many of the poor manage to earn a steady subsistence level of income for themselves and their families. Others, truly destitute are often without any means of livelihoods. They own no land, few productive assets and few opportunities to gain a share of economic progress. Even more noticeable are inequalities that persist across gender and caste groups. At even higher average risks are women headed households. Therefore, in the context of drought impact mitigation,, special attention needs to be drawn towards the concerns of the poor and vulnerable groups²⁷. The project has initiated land-lease farming for the landless and women-headed households. The primary objective of these pilots is to reduce risks of vulnerable groups by providing options to improve livelihood.

Activities and Indicators: The pilot focuses in organizing the poor and landless women, in particular single women households, into CIG for promoting better livelihood options. The project provides grant to CIG for taking agricultural land on lease and other fixed costs (land development, fencing, motor repairs, pipelines, etc). In addition, there will be effort to facilitate linkages with different institutions for credit, inputs and technical support during agriculture operations (Table 3.17).

Table 3.17: Activities, result areas and indicators of the leased land farming pilot

Activities	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Organizing the poor and landless women, in particular single women households, into CIG ▪ Extending technical and financial support for the development of leased-in land ▪ Cultivation of land with active participation of CIG members 	Increased income among women headed households	<ul style="list-style-type: none"> ▪ Improved access to resources ▪ Increase in income

Process: The pilot is implemented in four villages in Mahaboobnagar district, namely Chowdarpalli, Bomraspet, Doulatabad and Muktiphad. In these villages, the poor women

²⁷ Most of the literatures use vulnerability and poor as alternative synonyms. But vulnerability is not the same as income poverty or poverty more broadly defined. It means not lack of wants, but exposure to risks and defencelessness. It has two sides: The external side of exposure to shocks, stress and risks; and the internal side of defencelessness, meaning lack of means to cope up with natural and other crisis without damaging loss.

with higher vulnerabilities were identified and organised into CIG. The pilot was not grounded in Anantapur district at the time of baseline study. The process followed in the cultivation of the leased-in land was.

- **Fodder cultivation:** All the CIGs were involved in cultivation of fodder crops. Basing on this, they were also encouraged to start dairy activity or heifers rearing by linking financial support from banks as Income Generating Activity (IGP).
- **Nursery:** The CIGs in Muktipahad and Chowdarpalli have taken up nursery. The later was linked to APREGS.
- **Growing crops:** All the CIGs are involved in cultivation of crops like paddy, green gram, red gram, castor and vegetables.

CIG members borrow from the VO for carrying out agricultural operations. All the members provide labor for cash wages. The profit made at the end will be shared among members, after repaying loan to VO.

BASELINE STUDY

Sample: The sample for the study comprises of four CIGs. The baseline study also gathered information about the livelihoods of CIG members by covering all CIG members – 25 members in four CIGs.

Baseline period: The baseline period is Kharif 2007, i.e., the cultivation in the period May – July 2007

Methodology followed: An FGD was held with CIG members, and data was collected from individual members by using a questionnaire (see Appendix 5).

BASELINE FINDINGS

Socio-economic characteristics of sample

A majority of members are socially backward: Of the 25 members in the leased- land farming group in Mahaboobnagar district, 92% belong to lower castes.

Most members are illiterate: The average level of education of the members was less than one year of schooling. The low average value is due to the fact that nearly 84% of the members were reported to be illiterate. Of those who had received some education, a majority had only 5 years of schooling and only one person reported more years of education.

Most group members are middle-aged: The average age of the members was 39, and a third of the members were above 40 years (Table D-2 in appendix 4).

Most group members are from women-headed households: More than 70% of the CIG members were from women-headed households.

Most are not sole breadwinners of their households: The data also reveal that 28% of members are sole earner in the households, while others have family members to support. Of

them, 4 are widows, one is separated and another member's husband is ill. Among the members, sole earning members are more vulnerable than other CIG members. In fact, higher levels of vulnerability were noticed in the case of a member who was living in rented house and without any resources. Thus, it may be concluded that *most of the women-headed households are not sole earners.*

Majority of members have less than 2 acres of land: Around 30% of CIG members are landless while a majority (56%) of those having land own less than two acres (Table D-3 in Appendix 4). Another 12 % of the members have 2 to 3 acres and largest area owned by any member is 4 acres. This relatively wealthy farmer is interested in participating in the pilot because of potential economic benefits.

Most group members do not have any livestock: Overall, 64% of CIG members do not have any livestock, including 5 out of the 7 landless members, indicating high levels of vulnerability (Table 3.18). While 28% of them have buffaloes, 12% own bullocks and 8% possess cows. There is one member each with sheep and goat.

Table 3.18: Livestock possessed by members

Type of livestock	Number of members owning such livestock	Number of livestock owned	Percentage to total
Buffaloes	6	12	24%
Bullocks	3	6	12%
Cows	2	5	8%
Sheep	1	25	4%
Goat	1	4	4%
No livestock*	14		64%

* This number includes 5 landless households

Almost all CIG members are engaged in agriculture: Around 70% being primarily engaged as agriculture labor, and agriculture being the main occupation for a 25% (Table D-4 in Appendix 4). Of the remaining two members, one worked in the village crèche (*anganwadi*) and the other was a basket weaver. Seven members are involved in more than one activity: one agricultural labourer was also running a petty shop while another was working as a health attendant; among the others in agriculture, one member each is engaged in nursery, sheep rearing and running the village Public Distribution System shop; and the Anganwadi worker was also involved in dairying. The annual income earned by the CIG members from these livelihood activities ranges between Rs. 2000 and Rs. 6000.

Baseline status of indicators

The analysis of marital status of the members suggests that 72% of the members are women headed households, while 28% of members are the sole earners for their households. In Ananapur district, baseline information was not collected as the selection is in progress. In Mahaboobnagar district 28% of members are landless and 64% have no livestock. Five out of the seven landless households do not even have livestock, indicating high levels of vulnerability. Further these CIG members are primarily engaged as agriculture labor. For 24% of members, agriculture is the main occupation. The annual income size class shows that about 56 % of the total population belongs to BPL category.

Income size class distribution: The distribution of members by annual income size class is shown that there were more than one-fourth of members with less than an income of Rs. 10,000 per annum (Table 3.19). The data also reveals that 20 % of the members with an annual income of Rs. 10001-20,000, and 28 % with Rs. 20001-30,000. The rest of the members belong to the income class of Rs. 30001-40000 (16 %) or above 50000 (8%). The current criterion for BPL is an income up to Rs. 20,000 per annum in rural areas of AP. Viewed against this criterion, it could be seen that the proportion of BPL households was 56% of the members.

Table 3.19: Distribution of income-size class

Income group	Number	Percentage to total
<10000	7	28
10001-20000	5	20
20001-30000	7	28
30001-40000	4	16
>50000	2	8
Total	25	100

Vulnerable Groups: In the context of mitigation of impacts of drought, special attention is required towards the needs and concerns of the poor and vulnerable groups. Though very few livelihood groups can escape from the ill effects of vulnerabilities resulting from drought, the single women households, fisher communities and goat rearers seem to be severely affected.

The baseline indicators for the leased land farming pilot are summarized below (Table 3.20).

Table 3.20: Baseline on indicators related to Leased farming

Indicators	Mahaboobnagar
Functioning of CIG	NA
% members having livestock	64
% members having land	72
% members having non-farm activity	1
% members involved in services	1
% members in BPL category	56
% members engaged more than one activity	7

Supportive government programs: The government generally provides widow and old age pension to widows and women above 65 years age. In addition, such members will also be encouraged to work as Anganwadi worker, etc. SHGs will provide credit to single women to take up IGP activities.

CHAPTER 4: LIVESTOCK SYSTEMS

INTRODUCTION

This chapter discusses eight pilots seeking to improve agricultural production systems in rain-fed areas: (1) livestock health systems (vaccination); (2) fodder bank; (3) backyard poultry; (4) chick rearing centers (CRCs); (5) breed improvement in sheep; (6) ram lamb replacement; (7) goat rearer's common interest group (CIG); (8) goat crèche; and (9) inland fisheries. These interventions are aimed at: (i) reduction of economic losses due to animal falling prey to disease; (ii) improvement of indigenous livestock breed; (iii) improving local fodder resources; (iv) development of information and knowledge for institutional capacity building; and (v) risk mitigation through improving access to technology, credit, insurance and better market facilities. Thus, overall objective of these pilots is to improve the livestock population by reducing the risk related to diseases, feed source and productivity of livestock.

Following a brief description of each pilot, the nature of the baseline study carried out is described, followed by the findings of the baseline study. The description of each pilot comprises the context and rationale of its formulation, activities and practices proposed, process to be followed, result areas and indicators and the number of pilot participants. The description of the baseline study contains the sample of stakeholders consulted for the baseline study, the methodology used to collect information and the baseline study period. The findings comprise the socio-economic background of the sample surveyed, production characteristics, the baseline value of indicators including activities and practices being followed currently and economics of the activity, and existing government programs on issues concerning the pilot.

COMMUNITY-MANAGED LIVESTOCK SERVICES (VACCINATION)

THE PILOT

Context and Rationale: Livestock form an integral element in dry-land production systems²⁸. In India, livestock made up 8 % of household wealth and contribute to approximately 15 % of household income (Walker and Ryan, 1990)²⁹. Infact, rural women make more benefits by managing small-scale livestock than paid employment gained from unskilled labour work. This is because it is easier to operate a productive enterprise in having small scale livestock because the initial investment costs are low. Profits may be low, but so are the risks. Wherever possible, women prefer to own cattle such as cows and buffaloes because they are more profitable and bring greater personal status.

Improving livestock production systems is desirable not only to sustain agricultural growth but also to reduce the rural poverty as majority of the people in rural areas have small land holdings. For such people, livestock forms an important source of income as it ensures the supply of bi-products such as milk, eggs and is also steady source of cash flow. Further

²⁸ Livestock are an important component of framing and livelihood system, with rural households keep cattle, buffaloes, poultry, goats and sheep.

²⁹ Walker, T.S, and Ryan, J.G (1990): Village and household economies in Nidia's Semi-arid Tropics. Baltimore: John Hopkins University Press

during the times of disaster these animals can be easily liquidated for cash. But unfortunately, due to low productivity and lack of adequate resources to provide balanced feed, a majority of livestock rearers are able to make only marginal profits.

Though elaborate system for preventive vaccination has been established by the state government, the percentage of coverage across the animals is not adequate. Low level of awareness among the communities, resistance among the people on vaccination, inaccessibility of public vaccination programmes are some of the reason for the above situation. Animal Husbandry department also suffers from insufficient deployment of human resources thus resulting in low level of coverage particularly in case of small ruminants and so called “indiscreet” livestock, plough bullock and poultry.

Activities and Indicators: The pilot on preventive vaccination services has been implemented under APDAI in collaboration with Mandal Mahila Samakhya (MMS) and Animal Health department. The pilot is reaching out to SHG members by focusing on bovine animals³⁰. It is expected that pilot contributes to vaccination at door step of villagers.

Table 4.1: Activities and Indicators for the Livestock Health Services (Vaccination) Pilot

Practices Promoted	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Streamlining the vaccination services with active participation of CBOs and appropriate linkage with line department ▪ Sourcing or developing para workers for vaccination service delivery ▪ Identifying and establishing necessary infrastructure for sustainability of institutionalised livestock preventive health care services. 	MMS/VO in animal vaccination services	<ul style="list-style-type: none"> ▪ Number of SHG members who accessed vaccination services ▪ Level of community awareness ▪ Availability of trained para worker ▪ Linkage between para-worker and VAS Number of members who made payment for services

Against this backdrop, for each of the pilots undertaken in the study area, the result areas and the corresponding indicators have been identified and given in the table 4.2. The whole purpose of this exercise is that it would facilitate tracking of the progress made in respect of each pilot with the help of the indicators identified towards the goal as spelt out in the form of result areas.

BASELINE STUDY

Sample: In the case of community managed livestock health services and back yard poultry in each of the project villages, three members were randomly selected from among the members involved in the activity. But, for fodder bank, besides organising FGD with CIG members, data were also collected from five CIG members, who were selected randomly, by using a structured questionnaire. With regard to breed improvement in sheep, FGD was conducted with participant members. The baseline information was collected for all the pilots in the case of Mahaboobnagar. However, in the case of Anantapur district the only baseline information for community based Animal health services was collected, as efforts were still on to start other pilots.

³⁰ For small ruminants medical kit was placed with CIG for delivering vaccination services. The CIG members are expected to pay for the services and amount thus mobilized will be used for replenishing medicines on regular basis.

The pilot was launched in 4 villages namely Gokafasalbad, Doulatabad, Lodhipur, and Kottur in Mahaboobnagar district. The baseline data were collected from all the members involved in the activity by using structured questionnaire. A total of 20 members -five from each village -were covered under the baseline study.

Baseline period: The baseline period is taken to be July 2006-June 2007 in Mahaboobnagar and January 2007-December 2008 in Anantapur

Methodology: Three SHG members with livestock population and who participated in the pilot were randomly selected and administered the questionnaire.

Sample: A total of 1722 members participated in the pilot from Mahaboobnagar and the information is not yet available with the MMSes in Anantapur.

BASELINE FINDINGS

Socio-economic background of members

Most members were backward: More than half of the sample members in Mahaboobnagar and Anantapur district belong to BC community. SC and ST members occupy second position in Mahaboobnagar and Anantapur districts.

High degree of illiteracy: About 80% of the members are either illiterate or semi-literate.

More households have bulls and cows: The proportion of households having bulls is higher followed by cows and buffaloes. However, in terms of number of animals possessed, cows occupy first position followed by bulls and buffaloes. In this respect, the similar trends were noticed in the case Mahaboobnagar district.

Table 4.2: Livestock possessed by vaccinated

Livestock	Total number of animals			Animals vaccinated			Average cost per animal for each vaccination		Animals died
	Number	Average per house holds	Range	Number	Average per house holds	Range	Medicine	Service	
MAHABOONNAGAR									
Bulls	129 (40)	3.22	1-10	57(23)	2.48	1-5	20	4.20	3
Cows	172 (34)	5.06	1-17	98 (21)	4.67	1-15	48.12	2.66	3
Buffaloes	74 (22)	3.66	1-8	39 (14)	2.79	1-8	10.78	5.75	0
ANANTAPUR									
Bulls	38 (20)	1.9	1-2	27 (14)	1.93	1-2	24.28	5.23	0
Cows	63 (22)	2.86	1-10	41 (15)	2.73	1-10	41.14	5.38	1
Buffaloes	42 (14)	3	1-12	36 (8)	4.5	1-12	28.57	3.8	0
OVERALL									
Bulls	167 (60)	2.56	1-10	84 (37)	2.20	1-5	22.14	4.71	3
Cows	235 (56)	3.96	1-17	139 (36)	3.7	1-15	44.63	4.02	4
Buffaloes	116 (36)	3.33	1-12	75 (22)	3.64	1-12	19.67	4.77	0

Baseline status of indicators

Around half the livestock are vaccinated: While overall about 60% of the total cows, buffaloes and bullocks had been vaccinated, the proportion was lower in Mahaboobnagar (48% of buffaloes, 44% of cows and 43% of bulls) compared to Anantapur (85% of buffaloes, 71% of bulls and 65% of the cows) possibly due to APRLP interventions.

Quality and timeliness of vaccination: At the aggregate level, three-fourths of the sample members opined that the quality of the vaccination is either satisfactory (68%) or very satisfactory (10%), while one out of every four members is not happy with the quality of the vaccination (Table 4.3). The same trends were observed in both the districts.

Table 4.3: Perception on quality of vaccination Mahaboobnagar

Responses	Mahaboobnagar		Anantapur		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
Very satisfactory	4	9	3	12	7	10
Satisfactory	28	67	18	69	46	68
Not satisfactory	10	24	5	19	15	22
Total	42	100	26	100	68	100

Timeliness of vaccination service delivery: At the aggregate level, about 44% of the sample respondents reported that vaccination was carried out at appropriate time by the veterinary department (C-3 in appendix 3). About 22% of the members also felt that veterinary department never adheres to time. However, it is important to note that about one third of the sample respondents reported that no vaccination programme was carried out. These farmers stated that vaccination was conducted without proper information. Some of them also stated that fewer village visits were made by the veterinary people and therefore, they had taken animals to veterinary centre for vaccination and other medical services. More than half (57%) of the sample respondents in Mahaboobnagar reported that vaccination was carried out at appropriate time by the veterinary department. The rest of the members were not happy either on account of non-adherence to time (10%) or vaccination programme was not carried out by the veterinary department. The important variation between Anantapur and Mahaboobnagar district is that more members in the case of former reported non-adherence to time by the department.

Cost incurred on medicines: The cost incurred on medicine per animal was higher for bulls and cows in Mahaboobnagar than Anantapur district. However, the cost incurred on medicine for buffaloes is more than double in Anantapur when compared with Mahaboobnagar. In terms of service charges, the sample farmers of Anantapur spent more than Mahaboobnagar farmers. Almost one-third of the sample farmers in the both the districts have reported that they have not vaccinated animals. With regards to quality of vaccination services, 80 % of the sample members in Anantapur and 66% in Mahaboobnagar have expressed satisfied. On the contrary, only 23% the sample members in Anantapur reported that vaccination was carried out at appropriate time by the veterinary department as against 57% in Mahaboobnagar.

Little community role in vaccinations: The information gathered from the field suggests that the members in both the districts did not receive much support from SHG or VO in vaccination. They also reported that there is dependence on Veterinary Assistant Surgeon (VAS) for health services.

The baseline values of indicators are summarized in Table 4.4.

Table 4.4: Baseline values of indicators related to animal vaccination

Indicators		Baseline status		
		Mahaboobnagar	Anantapur	Overall
% of animals vaccinated	Bulls	44	71	50
	Cows	57	65	59
	buffalos	52	85	64
% of members who have made payment for services	Bulls		48	
	Cows		88	
	buffalos		44	
% of members not vaccinated any animals		33	35	34
% of members satisfied with quality of services		76	81	85
% of members reported timely service delivery		57	23	44
Availability of trained para-worker		NA	NA	NA
Linkage between para-worker and VAS		NA	NA	NA

Supportive government programs: Livestock vaccination programme is primarily aimed at preventing epidemics. Therefore, the villages where a disease was prevalent (based on disease occurrence in previous year or in recent years) will be covered. So, there is no compulsion to cover all the villages. Department of Animal Husbandry through VAS and his staff delivers vaccination services at village level. Vaccination services is done at free of cost. Vaccine is supplied by department of AH as per the indent placed by local VAS. Indent is placed based on the disease surveillance report and census data.

FODDER BANK

THE PILOT

Context and rationale: One of the serious problems concerning the livestock owners is fodder shortage in summer and more particular during drought periods. There is increase seasonal fodder scarcity because of reduction in the tree based fodder and lack of community based institutional mechanism for overcoming fodder security. In view of the above, the fodder bank pilot was launched as a support activity under livestock development, implemented in order to meet the fodder requirement of the cattle rearing households in the drought prone areas. .

Activities and Indicators: The important activities of the pilot are organizing households with fodder scarcity in to CIG, which acts as a village level platform of a primary stakeholder group to work on fodder initiatives, and mobilizing resources and support from the AHD

(Table 4.5). The CIG members save Rs.100 once in three months, procure fodder by using resources provided by APDAI and take up fodder production.

Table 4.5: Activities and Indicators for the Fodder Bank Pilot

Practices Promoted	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Forming CIG by organising households having livestock population, but facing fodder shortage ▪ Establishing fodder bank to overcome fodder shortage ▪ Fodder integration with farming system through distribution of fodder seed, trees and inter-crops 	<p>Fodder production, management and usage is carried out by CIGs</p>	<ul style="list-style-type: none"> ▪ Number of CIGs formed and strengthened ▪ Quantum of fodder procured ▪ Area under fodder production and tree based fodder ▪ Number of members accessed fodder during scarcity period ▪ Number of farmers who repaid fodder to the fodder bank

Process: The households with livestock and facing fodder shortage are organized into CIG. The groups are engaged in procurement and distribution of fodder and also in encouraging members to take up fodder development activities in their fields and common grazing area. As stated earlier, the pilot was launched in 4 villages in Mahaboobnagar district. This is a support activity under livestock development.

BASELINE STUDY

Sample and Methodology: For the purpose of the study of the pilot, the information was collected from the four CIGs in Mahaboobnagar district. In addition, information was also collected from selected members of CIG about the fodder scarcity. The baseline information for Anantapur was not collected.

Baseline period: The baseline period for study was July 2007- June 2008.

Methodology followed: The information was collected by conducting FGD with the CIGs and gathering specific information from individual members in order to quantify fodder scarcity.

BASELINE FINDINGS

Socio-economic characteristics of sample

Caste status: More than three-fourths of the sample members belong to BC (50%) and SC community (30%).

Literacy levels: With regard to literacy level, only 35 % of the sample members are literate. Almost all the members, except on member, are primarily dependent on agriculture.

Livestock ownership: The livestock ownership among the members indicates that all of them, except one, have bulls. The members having cows and buffaloes are 60 and 25 % respectively. On an average each of the household possesses about 3.5 bovine animals, which indicates fodder requirement of the sample members.

Primary occupation: The primary occupation details were collected in order to understand their dependency on livestock for earning their livelihoods. The data reveal that agriculture was the major source of income for almost all the CIG members (Table 4.6). Only exception to this is a member from Gokafaslabad, whose primarily occupation was agriculture labour. It would be of interest to note that for none of the members livestock is a primary occupation.

Table 4.6: Classification of households based on Primary occupation across villages

Name of the village	Primary occupation			Total
	Agriculture	Agricultural labor	Livestock	
Gokafaslabad-CIG	4	1	0	05
Doultabad-CIG	5	0	0	05
Lodhipur-CIG	5	0	0	05
Kottur-CIG	5	0	0	05
Total	19	1	0	20

Livestock ownership: As regards the livestock possession, a majority of the members own bulls (table C-4 in appendix 3). Further, 60 % of the members have cows and 35 % goat. Only one sample member has sheep – possesses 60 animals. The fodder bank activities are initiated to meet the fodder requirements of bovine animals. Of the bovine animals, cows are more in number, followed by bulls and buffaloes. There is slight variation across the CIGs with reference to ownership of bovine population. The CIG in Gokafasalbad have more bovine animals (35) followed by Doultabad (34). The least bovine population is recorded from Lodhipur. This gives insights about fodder requirement.

Production characteristics

The members have produced 258 quintals of fodder by growing food crops like paddy in about 55 acres. The average yield per acre is 4.7 quintals. In addition, 11 members have purchased fodder from market to the tune of 282 quintals. It is not a common practice among members to grow fodder crops.

About 40% of the members have resorted to selling of livestock due to fodder scarcity. It may interesting to note, two members kept their livestock in their relatives' place in order overcome fodder shortage. Only 4 out of 20 members have reported to have obtained support from the government. It is interesting to note that one of the members have taken a loan from SHG for purchase of fodder. None of the members have received any support from government in terms of plantation.

Baseline status of indicators

Fodder requirement: The common practice among rearers is that cattle are taken for grazing in CPRs/fallow lands during day time and stall feeding³¹ in evening. However, priority is

³¹ Dry fodder includes paddy, sorghum, maize and millet straw.

given to bulls and milch animals and fed additionally with green grass and cattle feed³². The CIG members stated that they were meeting the fodder requirement of the cattle from the byproducts of crops such as paddy, jowar and groundnut. In the event of shortage, the members procure fodder from other farmers within and outside villages. Some of the members have also reported that they stored the husk of red gram in order to feed animals during drought and fodder scarcity period. In general there was no practice of cultivation of fodder grass among the sample members. However, one CIG member in Gokafaslabad had cultivated CO-1 variety of grass in one acre and produced about 20 quintals of fodder during the baseline period.

Fodder produced and purchased by CIG members. The sample members have cultivated food crops in 55 acres and produced 258 quintals of fodder (Table 4.7). Out of 20 sample members, 11 members have reported fodder shortage during baseline year. It is important to note that all the sample members in Gokafaslabad reported fodder shortage (table C-5 in appendix 3).

Table 4.7: Particulars of fodder produced from paddy and other crops

Name of the village	Area (acres)	Quantity (quintals)	Corresponding cost (in Rs.)
Gokafaslabad	18	48	12000
Doultabad	09	45	11250
Lodhipur	20	90	22500
Kottur	8	75	18750
TOTAL	55	258	64500

Fodder shortage: In other CIGs only 40 % of the members have reported fodder shortage. It implies that some of members were made members of the CIG even though they are not facing any fodder shortage. This is suggestive of the fact that the targeting of the farmers for the pilot was not properly done. It is to be noted that none of the farmers reported the availability of excess fodder.

Institutional support: The analysis of the data pertaining to the support received by the members from the government and other institutions in relation to fodder indicate the following. Out of 20 CIG members, four members have received fodder and one member fodder seed from government under drought relief package (table C-6 in appendix 3). The data also shows that one member has taken a loan from SHG for purchase of fodder. Thus, the government support did not reach all the members barring a few.

Distress sale: Another important indicator to be examined in the context of fodder bank is extent of distress sale of livestock by the members. The baseline scenario suggests that about 55 % of the members sold away animals during the baseline period (table C-7 in appendix 3). The total number of animals sold by them was 40. It emerged from the discussion with the members that the cost of fodder to feed the animal during the drought period will be more than the cost of the animal. So, they resorted to selling of animals rather than undergoing stress by retaining them. In fact, the sale of animals due to scarcity was in all the CIGs.

³² Green fodder includes sorghum, maize, green grass, napier grass and others. Cattle feed includes rice bran, crop-fine products, cakes, grain and cooked food, Gur and salt, etc.

The baseline values of indicators are given in Table 4.8.

Table 4.8: Baseline on selected indicators related to fodder

Indicators	Mahaboobnagar
No. of CIGs formed and strengthened	NA
Quantum of fodder procured (quintals)	258
Area under fodder crops and tree based fodder	0
Total fodder procured due to scarcity ((quintals)	5
No. of members accessed fodder from fodder bank	NA
% of members sold livestock	40
% members accessed government support	20

Supportive government programs: The Government generally provides supplementary feed to the selected farmers to overcome fodder shortage. Further, conducts fodder camps during severe drought years and farmers from different villages to bring animals to a camp and stay there.

BACKYARD POULTRY

THE PILOT

Context and Rationale: Back yard poultry is good source of income to the farmers as it is relatively less susceptible to climate change. Traditionally, poultry in India was limited to rearing chicken in their backyard. The chicken, grown in their backyard, do not need special feed as they freely roam around and pick up their feed such as insects, waste food etc. People sold or used it for consumption as and when the need arose like during festivals and marriages. The approach towards managing chicken is casual. In other words, no additional cost was spent either on the feeding or caring of the birds. The activity also faces certain constraints like unavailability of chickens at regular basis, higher incidences of diseases and low or no marketable surplus. In this section we will analyze baseline situation of backyard poultry based on the information collected from the sample households.

Activities and Indicators: The activity has three stages namely, rearing of one-day chicks³³, backyard activity and marketing eggs and birds (Table 4.9).

Table 4.9: Activities and Indicators for the Backyard Poultry Pilot

Activity	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Supply of egg laying variety (improved <i>Desi</i>) birds ▪ Vaccination services and primary health care for backyard poultry. ▪ Insurance activity 	Increase in bird population in program villages	<ul style="list-style-type: none"> ▪ No. of birds per household ▪ Annual production of eggs ▪ Provision of vaccination and health care services ▪ Increase in income from eggs and sale of birds

³³ One-day chicks will be reared for 45 days in chick rearing centre at village level with centralized input supplies.

Process: The APDAI is promoting backyard poultry activity among SHG members, as supplementary source of income. The activity has three stages namely, rearing of one-day chicks³⁴, backyard activity and marketing eggs and birds.

- The pilot promotes egg laying bird varieties (which lay birds for 200 days in a year) such as vanaraja and rajasri.
- MMS supplies one-day chicks to CRC, where chicks are reared under controlled environment for 45 days.
- SHG members purchase 45-day birds (reared in CRC) for backyard activity; and rear birds scientifically taking preventive measures against disease.
- Identification of Households who are interested take up Back yard Poultry; and Identification of Health Activist (woman) and imparting trainings on health care to streamlining vaccination services and primary health care for backyard poultry

BASELINE STUDY

Sample: For the purpose of the study, a total of 42 households covered by the pilot were surveyed, comprising the three best framers selected from each village.

Methodology: Three SHG members who participated in the pilot were randomly selected and administered a questionnaire

Baseline period: The baseline period was taken to be July 2006 –June 2007.

Methodology followed: The sample households were selected in consultation with VO and APDAI team. The information was collected from the selected households a specially-designed schedule. Further, Focus Group Discussion (FGD) was held with them to gather qualitative information.

BASELINE FINDINGS

Socio-economic characteristics of sample

Production characteristics

Most households have local variety of birds: Of the 42 households covered under the sample, only 30 households were having backyard poultry activity during the baseline period. Those who have poultry, 27 households rearing local varieties (197 birds) with an average of 7.30 birds per household (table 4.8). Remaining members (3) were involved in rearing of Vanaraja variety (40 birds). On an average each of the households possesses about 8 birds. A majority of the sample households have local variety of birds with them. Only 3 members have reported that they possess the hybrid Vanaraja variety.

³⁴ One-day chicks will be reared for 45 days in chick rearing centre at village level with centralized input supplies.

Generally, people purchase birds at the age of 5 months from neighbors or relatives. Some of the members have involved rearing birds on sharing basis³⁵. *In recent years, villagers have started* purchasing birds from local vendors and shandies. The purchase cost of the average grown bird ranges from Rs.60 to 100. In the discussion it was revealed that the major problem faced in promotion of backyard poultry, was unavailability of sufficient number of chicks. It was found that none of the village had chick rearing centre. However it was informed that chick rearing centre are present at district level.

Table 4.10: Type of poultry birds possessed by households

Type of birds	Number of birds	Number of households	Average
Vanaraja	40	3	13.33
Rajasri	0	0	0
Giriraja	0	0	0
Local	197	27	7.30
Total	237	30	7.9

Insurance: The data on insurance were collected with an intention to understand as how do members cope up with the loss caused due to mortality. It was found that none of the members have insured their chicks or birds, as there is no coverage for backyard poultry. Therefore, the members have no option but to bear the loss caused due to mortality.

Baseline status of indicators

Mortality rates: There is significant difference between mortality rate of local (11%) and vanaraja (50%). This implies that local birds more resistance to climate change.

Mortality Rate: The important indicator for analyzing the activity is mortality rate. It was found that the mortality was only 11 % in the case of local variety. On the contrary, the mortality in the case of Vanaraja variety was as high as 50 %. This may be due to the variation in adaptation between the two types of birds to local conditions. People also stated that local birds do not require much attention in rearing.

Revenue from sale of eggs and birds: As discussed earlier, it is possible to generate income from the backyard poultry through sale of eggs and birds. The analysis in this aspect reveals the following. The total number of eggs laid by birds of the sample households (between July 2006 and June 2007) is 725. It may be further noted that the egg production was reported only in the case two-thirds of the sample households (table C-8 in appendix 3). The annual egg production per bird ranges from 10 to 150. The total income from the sale of eggs is Rs. 230. It means the average income earned per household from sale of eggs is very meager. The income obtained from sale of eggs is too low. The data also show that 10 sample households have earned income by sale of birds. The total income obtained from sale of birds was Rs. 3850/- and on an average the income earned per household is Rs.385. The members are, therefore, earning income more from sale of birds than eggs. However, market information suggests that there is a demand for eggs and it will continue to grow due to nutritional value of eggs. At present, the demand for eggs is met through commercial production of poultry farms.

The status of baseline value of indicators is summarized in Table 4.11 below.

³⁵ Some members take birds on sharing basis, wherein the owner will get back parent birds along with chicks after first laying cycle.

Table 4.11: Baseline on selected indicators related to Backyard poultry

Indicators	Mahaboobnagar
Number of birds per household	8
Total egg production	725
Provision of vaccination services	0
Provision of health care services	0
Total income from sale of eggs (Rs.)	230
Total income from sale of birds (Rs.)	3850
Number of chick rearing centers	0
Percentage of centers making profit	NA
Number of members who repeated CRC activity	NA

Supportive government programs: On a small scale, the Animal Husbandry Department is supplying six-week birds at 50% subsidy to households through MMS and VO. VO supplies them to SHGs, which in turn distributes to members either on cash or sharing basis.

CHICK REARING CENTRES

THE PILOT

Context and rationale: As discussed earlier, rearing the chicks in the backyard is an age old practice of the rural poor. With the advent of the new breeds such as Vanaraja, Giriraja and Gramapriya, among others, several attempts were made to promote backyard poultry as a supplementary activity in rural poor households. The features of these new breeds are - increased egg laying capacity, non-brooding nature, plumage like in the native birds, quick gain in body weight and colored eggs. The experiences in the state suggest that regular availability of chicks is a constraint. Hence, the pilot was initiated under APDAI.

Activities and indicators: For managing CRC, selected SHG members will trained and involved as entrepreneurs. One-day chicks were brought and supplied to CRC by MMS. The chicks are reared under controlled environment for 42 days; and supplied these birds (reared in CRC) to SHG members for backyard activity. The activity is also aimed at creating livelihood/ employment opportunities to the poor

Table 4.12: Activities and Indicators for the Chick Rearing Centre Pilot

Activity	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Establishing chick rearing centre ▪ Selection and training of SHG members (as entrepreneurs) for managing CRC ▪ Supply of 42 day birds to SHG members for backyard rearing 	Establishing chick rearing center	<ul style="list-style-type: none"> ▪ No. of chick rearing centres ▪ No. of centres making profit ▪ No. of birds supplied to backyard activity

Process: The pilot proposed to establish Chick Rearing Centers (CRC) to feed birds for backyard yard poultry. The Village Organization identifies women for chick rearing centers in consultation with Mandal Mahila Samakhya. The rearers identify an existing vacant house suitable for chick rearing; necessary precautions (ventilation, safety etc.) are taken. Necessary infrastructures (brooders, feeders and water tubs) are arranged in the centers. The rearers are

given orientation and training on chick rearing. The chicks are obtained from the Project Directorate- Poultry, GoAP by placing a bulk order; and two-day day old chicks (with one dose of vaccination completed) are distributed to the centers. MMS provides both chicks and feed as a loan to the rearing centers. Each center rears about 200 to 400 chicks depending on the capacity and local demand. Loan is repaid by the women maintaining the rearing centers after the chicks are sold out. The repaid amount is used again as start-up capital for the next cycle.

BASELINE STUDY

Sample: The sample for the study comprises of all the CRCs implementing the pilot, i.e., from 8 CIGs

Methodology: Information was collected by conducting FGD with care takers, VO, VA and MMS.

Baseline period: The baseline period is July 2006 to June 2007, since the pilot began in July 2007.

BASELINE FINDINGS

Socio-economic characteristics of sample

Production characteristics

- People in general focus on rearing of local birds as part of backyard poultry. These birds lay eggs up to 50 in a year. As a result, there is a limited focus on sale of eggs. The eggs laid in rainy and winter seasons are used for hatching, as the period is most conducive.

Baseline status of indicators

- The major problems faced in backyard poultry activity are predation and non-availability of sufficient number of chicks. It has emerged from the people that they do not pay much attention on diseases and predation. They felt that they have been managing backyard poultry very informally, as they did not receive any training on scientific way of rearing of birds.
- The birds are purchased from others in the villages, relatives, nearby shandies and vendors. The age at which birds are purchased ranges between 2 and 5 months. Very rarely birds are purchased for rearing. The average cost of a bird ranges from Rs.60 to 100 depending on its age.
- In the project villages, chicks are hatched by hen. There is also a chick rearing centre at the district level, which supplies chicks in the villages through vendors or shandies. Therefore, in recent years, people have started purchasing other varieties. People felt that the mortality is higher for these birds compared to local birds.

Supportive government programs: The government initiatives are mostly focused in providing the birds (8+2 units) to households. In a small way, chick rearing was attempted under APRLP in order to ensure availability of birds.

BREED IMPROVEMENT IN SHEEP

THE PILOT

Context and Rationale: Small ruminants have a greater role to play in supporting the family especially in drought situation. Among all the small ruminants sheep rearing is one of the major source of livelihood in drought prone areas. The Deccani breed sheep is more suitable as it can withstand drought conditions – for its ability survive on meagre vegetation and resistance for diseases. The pilot was taken up to improve breed by introducing deccani rams in their flocks for the following reasons:

- **Inbreeding:** Sheep rearers generally select breeding rams from their existing flocks, resulting in inbreeding and high mortality rate due to increased disease incidence. The size of the rams and body weight are also decreasing over a period of time.
- **Cross breeding:** Because of the body weights rearers prefer Nellore breeding rams in their flocks. The resultant cross breed of local and Nellore breed lambs are prone to diseases, and over a period of time lose their resistance power. This is resulting in massive deaths.
- **The wool:** Pure Deccani breeding rams wool is useful to make blankets and other material. After crossing with Nellore rams, there will be reduction on the quantity of wool; and rearers do not get good quality wool to make blankets and other material.

Activities and indicators: As part of the implementation of the pilot, two activities were initiated. The introduction of pure Deccani breed rams in the flock at the age of 2 years. In addition, women members are encouraged to take up ram-lamb rearing to ensure availability of breeding rams. Rams are purchased at the age of 4 months and reared for 1 year. The pilot is also expected to facilitate linkages with the banks and line departments for credit and support services respectively (Table 4.12).

Table 4.12: Activities and Indicators for the Sheep Breed Improvement Pilot

Activity	Result area	Indicators
<ul style="list-style-type: none"> ▪ Introducing pure Deccani breed rams in the flock ▪ Ram-lamb rearing by women ▪ Rearing nucleus flock of pure Deccani breed ▪ Linkages with the banks and line departments for credit and support services respectively 	<ul style="list-style-type: none"> ▪ Increase of flocks with pure Deccani breed rams 	<ul style="list-style-type: none"> ▪ Increase of flocks with pure Deccani breed rams ▪ Increase in weight of progeny ▪ Reduce the mortality rate of the sheep ▪ Income through ram-lamb rearing

Process: The MMS has supplied breeding rams and 4 month old lambs for rearing. The Veterinary doctor is expected to visit regularly to orient/support and provide technical support to rearers. The members received basic orientation and insurance support. The pilot also facilitates the health services by linking to line departments and involving para-workers.

BASELINE STUDY

Sample/ Methodology followed: The study covered the members involved in replacing breeding rams (five rearers) and ram-lamb rearing (four women members) activities.

Methodology: Information was collected from all the participant members by using a field schedule.

Baseline period: The baseline information (T0) was collected for 2005-06.

BASELINE FINDINGS

Socio-economic characteristics of sample: All the members involved in the activities under pilot belong to BC community and are illiterate. They primarily depend on sheep rearing activity for their livelihoods.

Production characteristics

Generally, the rearers choose the breeding rams either within their flock or from other rearers. In the recent years, they have started introducing Nellore variety of rams in the flock. Rearing of breeding lambs is not a common practice in the area. However, in the area (outside APDAI village) has taken up this activity (but Nellore variety) in his horticulture farm and gained profit from this activity.

General practice of rearers is that they select breeding rams within the flock. In this case, they need not invest any money on purchasing of breeding lambs. The rearers also have habit of selecting breeding animals from the local market or other rearers. Once a breeding animal is introduced into the flock, it will be kept for a maximum of two to three years. After which, the old ram will be taken out of the flock and new ram is introduced. For the last five years, the rearers have started introducing Nellore variety of rams in the flock. These breeding rams are purchased from Shapur in Karnataka. The rearers observed the following advantages with each of these varieties.

- The rearers also opined that in Deccani breed, tolerance towards the diseases as well as their survival rate is high compared to Nellore variety.
- In the case of Nellore variety the weight of the ram is more. The difference in weight between the two varieties is conspicuous even at age of 2-3 months. The weight gains at different age for Nellore rams are: 4-5 Kgs at age of 2 months, 13 kgs at the age 6 months and 1 year old weighs about 30-35kgs .On the other hand the weight gain for Deccani breed are 3 kgs at the age of 2 months, 8 kgs at the age of 6 months and 1 year old weighs about 20-25kgs.
- The sheep are generally sold at an early age of 4-5 months to avoid the losses from diseases and also to gain quick income especially during the time of drought. In the case of Deccani Variety rearers can gain only Rs. 700-800 for a 4 month old lamb. On the other hand, Nellore variety lambs fetch Rs. 1600 at the age of just 2 months.

Baseline status of indicators

The discussion with people revealed that rearing of breeding lambs is not a common practice in the area. However, Narasaapa from Gummalladda village has recently taken up this activity. He bought 70 three-month old Nellore variety lambs. These kids were reared in his horticulture farm. Moreover it was also informed that animals grew well due to availability of surplus grass in his horticulture farm. Another advantage was availability of space for grazing and growing. In the words of the group members who participated in FGD, he made a profit of about Rs. 60,000 from this activity.

Replacing breeding-Lamb: Among all the small ruminants sheep rearing is one the major source of livelihood in drought prone areas. However the major problems faced in sheep rearing are inbreeding, cross breeding and high mortality rate.

- Sheep rearers choose the breeding rams either within their flock or from other rearers.
- In the recent years, they have started introducing Nellore variety of rams in the flock.
- Though rearing of breeding lambs is not a common practice, one farmer in the area (outside APDAI village) had taken up breeding Nellore lambs.
- The rearers felt that Deccani breed has tolerance towards the diseases and adjust to local conditions. Only advantage with Nellore variety is the weight gain. The reares prefers to sell animals at an age of 4-5 months; and variation in selling price between the two varieties is to the tune of Rs. 600-800 per animal.

Supportive government programs: The department of Animal husbandry supplies breeding rams to selected rearers. But there is no special focus on developing local varieties.

COMMON INTEREST GROUP OF GOAT REARERS

THE PILOT

Context and rationale: Though goat is commonly accepted as liquid asset of the poor, it is seen as anti-environmental³⁶ by the Natural Resource Management (NRM) programmes. Hence, goat rearing was discouraged in the last two decades resulting in lack of support from the mainstream institutions.

The major problems faced by goat rearers include: lack of (i) facilities for prevention and control of diseases; (ii) insurance support; and (iii) supplementary feeding practices. Goat population has declined considerably as policies and programmes were not supportive for goat rearers before the pilot. Hence, Village Organisations (VOs) provided goat units to SHG members under the APRLP³⁷. The pilot attempts to establish the services and knowledge required for easing the constraints, enabling better access to services on an institutional

³⁶ Goat prevents growth of vegetation and natural regeneration as at it browses any type of species. It is also difficult to control goat while grazing, unlike sheep.

³⁷ In this scheme, VO provides one unit consisting of five goats to SHG members. The members are expected to return 5+1 goat after first birth cycle.

platform. It aims at evolving a networked goat enterprise based on a foundation of village level Common Interest Groups.

Activities and indicators: The important activities under the pilot are formation and strengthening of CIG for goat-rearers, institutionalising health care services, addressing fodder issues, etc (Table 4.13).

Table 4.13: Practices related to Goat CIG pilot

Activities	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Formation of CIG of goat rearers and its network ▪ Institutionalizing health services ▪ Addressing fodder issues ▪ Setting up of kids rearing centre. 	Organizing goat rearers into CIG and institutionalisation of services	Improved access to services Reducing the kids' mortality Increase in fodder availability

Process: Goat rearers were organized into Common Interest Groups (CIGs). Each member contributed membership ranging from Rs.100 to Rs.150 to the common fund of the group. Regular meetings of the groups are being facilitated. They will be involved in preparation of Biomass/ fodder development plans for individual lands, common lands in grazing tracts etc. The rearers are also encouraged to collect seeds of local trees/shrubs/creeper based fodder material. Plantings were done through APREGS program. The pilot also facilitates linkages with institutions for financial, insurance and health services. A training program on health aspects is organised trained by the Animal Husbandry department in all the villages for the groups.

BASELINE STUDY

Sample/Methodology followed: For the purpose of the study, FGDs were carried out with 11 CIGs of goat rearers in Mahaboobnagar and 2 CIG in Anantapur district by using checklist prepared for this purpose.

Baseline period: The baseline period for all the pilots in the case of Mahaboobnagar district is July 2006 to June 2007; and for pilots in Anantapur (as started in 2008) it is July 2007 to June 2008.

BASELINE FINDINGS

Socio-economic characteristics of sample

Most of the sample members are socially backward: The overall sample shows that around three-fourths of the members are BC. And the rest of the sample comprise of SC (14%), ST (5%) and OC (6%). The predominant social group in the sample covered in both the districts is BC. While SC members constitute second largest group in Mahaboobnagar, in Anantapur

it is ST group (table D-1 in appendix 4). In the case of goat CIG, the majority of the members in Anantapur district (60%) are from Scheduled Tribes and the rest 40% are from backward communities. Where as in Mahaboobnagar district the large part (62%) of the CIG members are from backward communities followed by scheduled castes (35%) other castes (2%) and Scheduled tribe (1%).

Production characteristics

Baseline status of indicators

Though goat is commonly accepted as liquid asset of the poor, is seen as an anti-environmental³⁸ by the Natural Resource Management (NRM) programmes. Hence, goat rearing was discouraged in the last two decades resulting in lack of support for this activity from the mainstream institutions. The major problems faced by goat rearers were: (i) lack of facilities for prevention and control of diseases; (ii) no insurance support; and (iii) absence of supplementary feeding practices. Goat population has declined considerably, as policies and programmes were not supportive to goat rearers. In view of the above, Village Organisations (VOs) have provided goat units to SHG members under APRLP³⁹. The pilot has evolved from this initiative.

Primary Occupation: Information on primary occupation of the sample members is collected with an intension to analyze the rate of their dependency on goat rearing activity. The analysis shows that agriculture was primary occupation for 60 % of the members, followed by agriculture labour (17%) and goat rearing (9%). Thus, one out of every 10 members was practicing the goat rearing (table 6.9).

Table 4.14: District wise classification of the CIG members based on the primary occupation

Primary Occupation	Number of CIG members				Total	Percentage to total
	Anantapur		Mahaboobnagar			
	Number	Percentage	Number	Percentage		
Agricultue	3	30	33	60	36	55
Agr.Labour	3	30	14	26	17	26
Goat rearing	3	30	3	6	6	9
Bus driver	1	10	--	0	1	2
flannel weaving	---	-	2	3	2	3
Basket making	---	-	1	2	1	2
Goat trading	--	-	2	3	2	3
Total	10	100	55	100	65	100

There is significant variation between the two districts. While goat rearing activity was a primary occupation for 30 % of the members in Anantapur, it is 5 %in Mahaboobnagar district. This implies that the dependency among the sample members on goat rearing was higher in Anantapur than in Mahaboobnagar. Thus, proportion of goat rearing was on par with agriculture and agriculture labour activity. On the other hand, agriculture was a primary occupation for almost two-thirds of the members in Mahaboobnagar.

³⁸ Goat prevents growth of vegetation and natural regeneration as at it browses any type of species. It is also difficult to control goat while grazing, unlike sheep.

³⁹ In this scheme, VO provides one unit consisting of five goats to SHG members. The members are expected to return 5+1 goat after first birth cycle.

Livestock Possession: A majority of the sample members own goat (90%), followed by bulls (41%), cows (36%) and buffaloes (20%). In fact, 12 % of the members also have sheep. However it is to be cautious that the income gained by goat rearing would not be 90 % of the household income as it is a primary occupation only for 9 % of the members.

There was not much variation between the two districts in respect of the possession of livestock by the members. However, Anantapur was slightly ahead of Mahaboobnagr in so far as the members owning goats is concerned, while Mahaboobnagar stand better with reference to other livestock. What is more significant is that none of the members in Anantapur have buffaloes and poultry.

Table 4.15: Number of sample households possessing livestock in two districts.

Livestock	Number of CIG members				Total number	Percentage to total
	Anantapur		Mahaboobnagar			
	Number	Percentage	Number	Percentage		
Goat	10	100	49	89.1	59	90.8
Sheep	1	10	7	12.7	8	12.3
Cows	3	30	21	38.2	24	36.9
Bulls	4	40	23	41.8	27	41.5
Buffaloes	-	-	13	23.6	13	20.0
Poultry	-	-	9	16.3	9	13.8

Notes: 1. Due to multiple entries the total does not tally with the number of sampled households.
2. Percentages are calculated to the total sample households.

Fodder Development Activities: Another indicator considered important for assessing baseline situation was fodder development by members. Details on fodder development activity were collected with an intension to understand supplementary feeding practices followed during the baseline period. There is not much variation between the two districts. The goat rearers, in both the districts, were taking goats for browsing in open/common lands. Though it is not common practice, 50 % of the members in Anantapur were providing husk from legume crops (i.e., red gram, horse gram etc) as a regular feed. On the other hand, in Mahaboobnagar, the members were providing supplementary feeding for pregnant goats and breeding animals. For this purpose, a few of the members have grown crops like horse gram in their own land. Information was obtained with regard to seed broad casting and raising of fodder species, particularly in common lands. The members in both the districts reported they were neither involved in such practices nor received any support from government in fodder development.

Goat Rearing Practices: Another indicator that requires to be looked into is the baby-goat rearing practices by members. There was not much difference between the two districts with reference to goat rearing practices followed. The members informed that the kids were kept under the basket for two months since their birth to protect them from predators and are fed with mothers' milk. In the next two months kids were fed with green leaves. The members have reported that they were not devoting exclusive time to keep watch on kids during day time. However, the aged and those at house will keep an eye on kids during day time.

Access to veterinary services: There is not much variation between two districts with regard to the access to the services particularly to vaccination and insurance. Goats were generally taken to near by veterinary clinics only in case of critical ailments. Some members keep

medicines ready for minor ailments by procuring medicines from medical shops, at times consulting veterinary doctors. They identify the medicine on the basis of its colour. As indicated earlier, goats are not covered under insurance coverage of any insurance company. So, none of the members have insured animals in both the district.

Market facilities: When enquired about market facilities it was informed that goats were sold to local traders or butcher in local market. The traders will also sell them in shandy or through other marketing channels. The members did not receive any support from the Government agencies in this aspect.

Baseline values of indicators related to goat rearing are in Table 4.16.

Table 4.16: Baseline on Indicators related to goats

Indicators	Mahaboobnagar
Functioning of CIG	NA
Vaccination services	0
Insurance	0
kids mortality rate	30
Supplementary feed	No data
Quantum of fodder produced	0
No. of fodder plants planted	0
Area under fodder crops	0
Special care in kid rearing	0

Supportive government programs: There is limited support from government, except vaccination services. All the government programmes discourages goats. As such this activity is also excluded from financial support from banks and government programmes.

GOAT KID REARING CENTRE (CRECHE)

THE PILOT

Context and Rationale: The situation analysis of kid rearing practices suggests that kids are kept under the basket or closed room. In other words, the kids are left under basket at the mercy of god. The reares are generally not taking special care in terms of cleanliness and feeding. Rearers usually sell the kids at the stage of weaning at low prices, reasons being: lean kids with low body weights; keeping the kids increases the flock size making it manageable. The kids are purchased from rearers and reared for 6 months (i.e. till the age of 8 months) and sold for slaughtering. Members can get good price by selling goats of 6 to 8 months age. Under the APDAI programme goat crèche was established in Doulatabad mandal of Mahaboobnagar district with an aim to provide a suitable environment for kids to grow.

Activities and Indicators: Kid rearing centre is to sustain goat population by reducing kids' mortality and early sale of kids (Table 4.17).

Table 4.17: Activities and impact indicators

Activities	Practices promoted	Indicators
<ul style="list-style-type: none"> ▪ Setting up of kids rearing centre. ▪ Education and awareness to CIG members 	<ul style="list-style-type: none"> ▪ Identifying a place and providing infrastructure for establishing Kid care centre ▪ Providing trained care taker ▪ Providing nutritive and supplementary feed 	<ul style="list-style-type: none"> ▪ Healthy kids ▪ Increase in weight of kids ▪ Saving of time by goat rearers

Process: Setting up of goat rearing centre to provide better hygienic conditions and to take special health care for the baby goats. VOs employ a caretaker to look after the crèche.

BASELINE STUDY

Sample/Methodology followed: The crèche was so far initiated only in one village (Doluatabad) of Mahaboobnagar district. Hence, the study covers the single crèche was being implemented in the district. The information on the crèche was collected by conducting FGD with CIG members, care taker and VO leaders.

Baseline period: The baseline period for the pilot is June 2006-March 2008, as it was grounded in 2008.

BASELINE FINDINGS

Socio-economic characteristics of caretaker: Mr. Mogalappa as caretaker until May 2008. In June, the task was assigned to Mr. Venkatappa, but it is his sister (Ms. Laxamma) and mother who actually manage it. Both the caretakers belong to BC community and were illiterate.

The analysis shows that only four members are continuing in CIG, while 7 of them left the group. Some members left the group by selling out goats, as they found that participating in AP-REGS is more remunerative than goat rearing. Hence they have sold out all the goats. All the members remaining in the CIG activity belong to BC community.

When enquired about kid rearing practices during baseline period, the members stated that they kept kids under the basket or closed room. They also reported that that no special care was taken in terms of cleanliness and feeding.

- **Mortality rate:** It was informed that around 20% of the baby goats died every year due to predation and also due to disease as no vaccination was provided at regular basis
- **Time spent:** With regard to time spent on looking after the baby goats, all the members informed that they did not allocate any time separately for this activity. The baby goats were left under basket at the mercy of god
- **Selling of baby goats:** It was revealed that a majority of the baby goats were sold at the age of 4 months to earn income and as a strategy to counter mortality due to diseases.

Supportive government programs: There is no government programme exists for this kind of activity.

TANK FISHERMEN’S COOPERATIVE SOCIETIES

THE PILOT

Context and Rationale: Andhra Pradesh has the distinction of having large number of tanks in India. The fishery rights in tanks are vested with the Fishery Department, which in turn allocates leasing right to dependent communities. User rights are formalized by registration of fishermen’s cooperative societies (called ‘cooperatives’ for short) by drawing members in a given locality. Fishery department approves membership depending on the availability of water-spread area. Tank based fishery activity provides livelihood opportunities for dependent households. Primarily, communities with leasing rights⁴⁰ can earn income by taking up fishery in tanks. In addition, fishing provides employment opportunities for local communities, in particular for those with fishing skills. Fishery also facilitates a range of business opportunities for local community as well as outsiders. Local communities will involve in fish vending (particularly women) and selling local markets.

The viability of fishery activity in a tank is directly related to periodicity of water received by tank. The productivity and livelihood opportunities provided by a tank are also dependent on the duration of water availability. Fishing brings complexity due to dependency of local communities on outsiders, in particular traders, contractors and middlemen for inputs, marketing, etc. In the process outsiders have gained larger control over production and marketing practices. As a result, local communities are not able to optimize benefits from fishing.

Livelihood opportunities also affected due to ineffective functioning of the cooperatives. In most of the societies leaders are largely controlling the affairs of the societies and often serving the interests of contractors and middlemen. Most of the cooperatives have neither own capital nor access to bank credit. They are not getting technical and management support. Under APDAI project, the tank based fishery activity was initiated with an intension of strengthening the fishermen’s cooperative societies and providing support to fishery community to minimising risks associated with fishery activity

Activities and Indicators: A survey will be conducted to identify the tanks with water for at least six months to nine months in the season, unorganized fishermen families are to be organized into cooperatives and existing cooperatives have to be strengthened (Table 4.18)

Table 4.18: Activities, result areas and indicators for the tank fishermen’s cooperative pilot

Activity	Result areas	Indicators
<ul style="list-style-type: none"> ▪ Organising and strengthening fishermen cooperatives ▪ Formation of women CIG for marketing ▪ Strengthening of institutions ▪ Credit, technology and infrastructure support to fishermen cooperatives 	<ul style="list-style-type: none"> ▪ Greater control by cooperatives over fishing ▪ Increase in income from fishery and subsidiary activities 	<ul style="list-style-type: none"> Proper functioning of cooperatives Improved access to credit, technology and other services Increase in Income Reduced dependency on traders and middlemen

⁴⁰ Tanks are being administered and controlled by different agencies in the state. The fishery rights in tanks are vested with fishery department, which in turn allocates leasing right to dependent communities. Rights are allocated to a group. User rights are formalized by registration of fishermen cooperatives by drawing members in a given locality. Fishery department conducts a skill test for providing membership. It approves membership depending on the availability of water-spread area.

BASELINE STUDY

Sample/Methodology followed: For the purpose of the study, FGDs were carried out with 4 cooperatives in Mahaboobnagar district and 5 CIGs in Anantapur district by using checklist prepared for this purpose.

Baseline period: The baseline period for the tanks covered under the pilot in Mahaboobnagar was July 2005- June 2006 in the case of Mahaboobnagar district. For the tanks in Anantapur district, the baseline period was July 2007- June 2008.

BASELINE FINDINGS

Existence of fishermen cooperatives: At the aggregate level, the total number of tanks covered under the pilot is 9. Of these tanks 4 are in Mahaboobnagar and 5 in Anantapur district. Almost two-thirds of the tanks do not have cooperatives. In this regard, there is variation between the two districts. All the tanks in Anantapur and two in Mahaboobnagar were without cooperatives (Table 4.19).

Table 4.19: Distribution of fishermen cooperatives in Mahaboobnagar district

Village name	Mandal	Tanks	Cooperative society	User right	Lease amount paid
Mahaboobnagar					
Gokafasalabad	Doulatabad	4	Registered in 1983	3 tanks from GP and one tank from fishery department	2800
Nagireddi pally	Bomraspet	1	Not registered	GP	1500
Bijjaram	Kosgi	1	Not registered	No right	No activity
Lodhipur	Kosgi	1	Registered in 1977	By fishery department	4500
Anantapur					
CM thanda		1	Does not exist	Individuals participate in auction	10000
Vepalakunta		1	Does not exist	Individuals participate in auction	2500
DR palli		1	Does not exist	Individuals participate in auction	900
Pallevandlapalli		1	Does not exist	Individuals participate in auction	5000
Gorantlavariipalli		1	Does not exist	Individuals participate in auction	20000

In the case of Mahaboobnagar, even in the two tanks where cooperatives do not exist, fisherman communities were organised by APDAI team in order to register as cooperatives. For example in Bijjaram, 100 members from the fisherman community have come together to register a society. As a result fishery activity is primarily taken up by fisher communities, with or without cooperatives. The total number of tanks covered by a society varies across the sample societies. A majority of these societies have leasing rights only on one tank. In case of the Society in Gokafasalabad, it has right over four tanks.

In Anantapur the members participating in an auction and obtained fishing rights from GP in individual capacity as no cooperatives exist. As a result, in some of the tanks, the lease amount went up to 20,000 due to competitive bidding. Therefore, under APDAI CIGs were formed in these villages. The total number of members organized into CIG is 23. Of these members, 17 are from Gandalapenta mandal and 6 are from Nallacheruvu mandal. In view of this, the functioning of cooperatives has been examined additionally wherever they exist, while in the case of the rest, only production arrangements and the economics of fishery activity has been analysed.

Management of Cooperative Societies in Mahaboobnagar district: The number of members varied across cooperative societies (Table 4.20). Thus, the FCS in Gokfasalabad had highest number of members, followed by Nagireddy palli, while Lodipur had the least number of members in the society. Women were not members of the societies surveyed. Women members in these communities are deprived of right over usufruct, in particular single women. One reason for this has been condition that person having fishing skills are eligible to become members in fishermen cooperative.

Table 4.20: Membership in the societies/CIGs

Village name	Total fisherman households	Members in society
Gokafasalabad	300	83*
Nagireddy pally	75	48
Bijjaram	100	32
Lodhipur	24	20

* Figures indicate registered members in the cooperative

**

Since the fishermen cooperatives exist in two villages, the analysis with regard to functioning of cooperatives will focus only on these societies. The General Body (GB) of tank fishermens cooperative societies comprises of all the members of the society. The GP is expected to meet twice in year, and also to elect its Executive Committee (EC) once in five years. The executive committee consists of president, vice president, secretary and 5 directors.

It appears that EC members were selected unanimous in most of the societies. Across the societies, the EC meetings were held once in a quarter and GB meetings once in a year (table D-5 in appendix 4). A dominant pattern observed was that President generally participates in government meetings, arranges finance and negotiates with contractor on behalf of the society; and delegates responsibilities among the different members.

All the societies had bank account and also maintaining books and records as a procedural requirement. The bank account was jointly managed by the president and other directors. Financial resources mobilized in the form members share capital, credit and other sources were not deposited in bank account. One of the reasons cited was that for withdrawal the societies need to obtain approval from AFO of fisheries department. Therefore, financial resources are generally parked with president; and any payment made will be recorded in petty cash book. At the end of the season, the society members look into accounts; and profit will be shared among members. The cooperative department carries out auditing annually as a formality.

The source of credit for a majority of the cooperatives was contractors. In the case of Lodhipur, the members had invested their own funds. As regards support accessed by the fishermen cooperatives from the government, the cooperative in Gokafasalabad availed technical as well as subsidy on seed. However, the society in Lodhipur could avail only technical support (table D-6 in appendix 4).

It is proposed under the pilot to form smaller groups within cooperatives in order to democratize its functioning and bring in greater participation from all the members. None of the societies had organized any small groups within the society as part of facilitating functional roles for workers, women and other members in the society during baseline period.

Production Characteristics

It is useful to examine how fishermen cooperatives use the right allocated to them in reality. The analysis on this aspect is not required in the case of Anantapur, as there were no cooperatives or CIG during baseline period. Two dominant ways of production arrangements observed in Mahaboobnagar at society level were: (i) society managing on its own; and (ii) sub-leasing to outside contractors⁴¹.

Out of the 4 tanks, in Mahaboobnagar, the societies have sub-leased activity in two tanks. While there is no activity in Bijjaram⁴² in the last four year, the society in Lodipur has taken up activity on its own by investing member's savings. In the case of the society in Gokafasalabad, the contractor and society share profit equally after deducting expenses. In this system the contractor bear the cost related to seed and lease amount; while the society members share the cost of watch and ward, and equipments such as fishing nets. On the other hand, in Nagireddypalli, the society has out-rightly sub-leased the tank to outside contractor; and the members of the society had shared the mount equally. The factor conditions favoured involvement of contractors was lack of financial and managerial capacities of FCS.

Baseline status of indicators

Income: At aggregate level, there was loss from fishery activity in a quarter of the tanks (Table 4.21). There is, however, variation between the two districts. The activity made profits in all the tanks in Mahaboobnagar and 40 % of the tanks in Anantapur district. In fact, all those cases reported loss from the activity were from Anantapur only.

Table 4.21: Economics of the activity

Tank	Total expenditure	Revenue	Net profit/loss
MAHABOOBNAGAR			
Gokafasalabad	40800	80000	39200
Nagireddi pally	3000	38250	35250
Lodhipur*	31000	31200	200
Total	74800	149450	74650
ANANTAPUR			
CM thanda	25500	60000	34500
Vepalakunta	47700	45000	-2700
DR palli	35700	21600	-14100
Pallevandlapalli	33000	40000	7000
Gorantlavari palli	38500	20500	-18000
Total	180400	187100	6700
Overall			
	255200	336550	81350

*Fish size could not be improved due to lack of sufficient water in the tank so FCS got lower price per Kg.

⁴¹ This arrangement benefits a few members within the society or contractors.

⁴² The discussion with fisher community has brought out the following facts in Bijjaram: The outsider has been carried out fisheries activity for almost 30 years. The local fishermen organized and opposed the outsider in taking up the activity in the year 2004. Since then there is no activity in the tank. The fishermen in the village have plans to register as cooperative and take up activity in the tank. The fisher community in the village has started the activity in the tank again since December, 2007.

- The cooperatives in Gokafasalbab and Nagireddy palli were able to make considerable profits⁴³. However, in the case of Lodhipur the cooperative had managed the activity without any loss. The reason for not making any profits in this case was that the fish were sold out at very early stage and did not fetch the expected price.
- The members incurred loss in three tanks and profit in two tanks in the case of Anantapur. Profits were reported in CM thanda (Rs. 34500) and Pallevandlapalli (Rs. 7000). The loss was heavy in Gornatalvaripllai followed by DR palli. In so far as marketing is concerned, the leased-in members had marketed directly. While 45 % of fish is sold to vendors, 10 % is purchased by the people in the village in small quantities for consumption. The rest of the fish is sold in nearby towns such as Kadiri, Nallacheruvu and Madanapalli.

Baseline values of indicators are given in Table 4.22.

Table 4.22: Baseline on indicators related to Fishermen cooperatives

Indicators		Mahaboobnagar
Existence of cooperatives		2
Functioning of CIG	Good	0
	Not so good	2
% formed small groups		0
% access to credit from banks		0
% having access to technology		1
% having access to other services		1
% depended on traders and middlemen		2
Total net income		74,650

⁴³ The total fish production from 4 tanks in Gokafasalabad was 10000 kgs. The production in Nagireddy palli and Lodhipur was 4200 kg and 2500 kg respectively.

CHAPTER 5: NATURAL RESOURCE MANAGEMENT

Natural resources have always been vital to rural people, inextricably entwined with their development and culture. The allocation, use, and protection of natural resources are among the India's most important policy issues. Therefore, another focus area of APDAI is governance of these resources, besides protecting and conserving. This chapter presents the baseline situation of pilots related to ground water and CPR. The baseline information for Anantapur district was not collected as these pilots are yet to be grounded. Hence, this chapter contains only information pertaining to Mahaboobnagar district.

CPR MANAGEMENT FOR THE POOR

THE PILOT

Context and Rationale: The local resource base of communities consists of extractive and self-renewal capital assets (Dasgupta 1982). It means people extract resources from common pool of resources without much investment. There has been decline in the quality and availability of common lands with the breakdown of traditional management systems and consequent erosion of community land rights. CPR's are not static but characterized by large seasonal and year-to-year fluctuations in productivity, extent of exploitation. In addition to these variations, different socio-economic and political factors have led the decline of CPR's in terms of extent, productivity and diversity⁴⁴. Despite rapid decline and deterioration in recent years, CPRs continue to play a significant role in providing livelihood options to the rural poor in the semi-arid regions of India⁴⁵.

Genuine and effective restoration of the local control over CPR's faced with several constraints from the side of both the state and the local communities. The state operates through its sectoral bureaucracy and village panchayats⁴⁶ when it comes to control of property or productive resources. In most cases, such bodies are small scale political bodies with very little concern and involvement in management (Jodha 1992, 1996). These bodies (despite recent focus on genuine decentralization) may not be a substitute for user groups, as their goals are too diversified, and natural resources constitute a small component therein. The solution to these constraints lies in genuine decentralization, and mobilizing and empowering user groups.

Though it is argued that significant investments have to be made for regeneration of CPRs, there is some evidence to show that it is possible to improve CPRs through natural regeneration and appropriate linkages with different government programs. Hence, APDAI has started a pilot for the development of CPR in Tirumalaiah Gutta of Gokafaslabad village in Doultabad Mandal.

⁴⁴ The excessive dependency of the communities on CPR for fuel wood, fodder and grazing has depleted vegetation in the existing CPRs.

⁴⁵ According to the National Sample Survey of 1998, the household average value collection from CPRs is Rs. 693 per annum at the all India level and Rs. 554 in Andhra Pradesh. Fuel wood forms a major part (58%) of the CPR collections, while fodder accounts for 25% and others 17%.

⁴⁶ Panchayats have legal powers and provisions devolved to it by the 74th Amendment to the Indian constitution.

Activities and Indicators: The key activities are organizing fodder dependent uses into CIGs, obtaining leasing rights from the Gram Panchayat (GP), plantation, soil and moisture conservation and linking up to government programs (Table 5.1).

Table 5.1: Activities, practices and indicators for CPR Management Pilot

Activity	Practices promoted	Indicators
<ul style="list-style-type: none"> ▪ Organizing dependent users into CIG ▪ Obtaining leasing rights by VO from GP ▪ Taking up plantation and, soil and moisture conservation measures ▪ Facilitating linkages with government programs 	<ul style="list-style-type: none"> ▪ Organizing dependent users into CIG ▪ Building Community role in enhancing productivity of CPRs 	<ul style="list-style-type: none"> ▪ Functioning of CIG ▪ Implementation of Social regulations by the community ▪ Total investment mobilized from NREGS-AP ▪ Number of wage days generated ▪ Survival rate of plants ▪ Income from social and economic benefits derived of CIG members

Process: The pilot starts with obtaining leasing rights by VO from GP, followed by formation of CIG with the very poor members of SHGs. For a comprehensive development of the CPR, an integrated natural resource management (INRM) plan is prepared jointly by the VO, CIG members and other villagers. These plans will be used to establish linkages with government programs such as AP-REGS. As part of developing the CPR plantation and soil and moisture conservation measures will be taken up. The CIG members will be involved in ‘watch-and-ward’ duties on regular basis to protect the plantation. A critical part of the process is establishing social norms for protection of the CPR in Grama Sabha⁴⁷.

BASELINE STUDY

Sample and methodology followed: The CPR pilot in grounded in Gokafaslabad by the VO has organized eight members into a CIG. Information about this pilot was collected by organizing FGDs with the CIG, VO and VA.

Time period: The baseline period for the pilot is June 2006-July 2007, as it started in 2007.

BASELINE FINDINGS

Social profile of participants

The total number of members covered under CPR is 8. Cross-classification of sample respondents based on the scheme in which they participated and their corresponding caste group and literacy levels is made (separately). As can be seen from Annex 1, the

⁴⁷ All the eligible voters (above 18 years of age) in a village are members of Gram Sabha. The Grama Sabha is an important instrument in the democratic and transparent functioning of local administrative institutions (called Panchayat Raj institutions). Village panchayats are required to conduct a Grama Sabha at least four times a year. The Grama Sabha approves the village development plan, village panchayat budget, audit reports of panchayat, the list of beneficiaries selected for various development programs and reviews the progress of all schemes.

members belong to SC (%) and BC (%) community. As regards literacy, the overall sample shows that only one member is literate.

Production Characteristics

In the past, CPR's have made a substantial contribution to the livelihoods of the small and marginal farmers, and landless households in rural areas. This particularly has been the case in high risk and low productive areas such as arid and semi arid regions. In general terms, CPRs have provided income generating activities, inputs to agriculture/home, environmental services and safety nets for people in drought years. Jodha (1986) reported that the proportion of income among the poor families based directly on CPRs is in the range of 15-25 percent. In other words CPRs play a vital role in reduction of their risks. Demand on CPRs has risen during the last century or more due to the growth of local human and/or livestock populations. The deterioration of CPRs has accentuated economic stress experienced by the poor.

Baseline Status of indicators

Tirumalaiah gutta (a hillock in Gokafaslabad) was selected for CPR initiative. It is a revenue common land with an area of 42 acres. It has only thorny bushes and sparse vegetation. Gram Panchayat has leased-out the hillock to the Village Organization (VO) for a period of 2 years. For the management of CPR, VO has formed a common interest group (CIG) by organizing 9 very poor women SHG members. Over a period, as resource improvement takes place, these members will also get user rights. The hypothesis of pilot is that the community management would halt the degradation of CPRs and the net social and economic benefits would motivate them for its management and development.

It was stated by the people in the village that the forest department had taken up plantation in Tirumalaiah gutta between 2001 and 2002. Nearly 10000 plants (mostly eucalyptus and jetropa) were planted in the hillock. This intervention has also created more than 200 person days of employment for the villagers. In addition, the department has also provided watch and ward for the protection of plantation for over a year. It would be interesting to note that the forest department did not involve community in the planning and management of the plantation. As a result, after the withdrawal of watch and ward, the villagers have again started grazing animals and collecting fuel wood in the hillock. Further, people have also cut and used eucalyptus trees.

When the pilot was initiated, the hillock was with scarce vegetation (i.e., thorny bushes) and without any species of economic value. The villagers were only depending on the hillock for fuel wood and grazing livestock. And the small ruminant rearers seem to have higher dependency on this hillock, in particular during rainy season. The total number of households depending on the hillock either directly or indirectly is 120. Apart from grazing and occasional fuel wood collection, people did not derive any economic benefit from the hillock. It is to be noted that a majority of the CIG members were wage earners and do not seem to have depended on the CPR for their livelihoods.

It emerged from the discussion with people in the village that the Forest Department has implemented Joint Forest Management programme in the surrounding villages; and they are partly aware of the benefits derived from the activity.

GROUND WATER INITIATIVE

THE PILOT

Context and Rationale: The important factors concerning water management are: (i) the communities in the rain-fed area face with the scarcity of water; (ii) at an increasing number of places and times, there is literally not enough water to meet people's needs; (iii) the water supplies are more vulnerable due to the variability of water availability; and (iv) ever rising water demands that persist from one season to the next throughout the year. As discussed in Chapter 2, the important sources of irrigation in the project area include tanks and bore wells. Tanks are important means to conserve precious water resources in semi-arid areas⁴⁸. It is well known that tanks traditionally performed a useful role in providing irrigation. Over a period, tanks were neglected and farmers shifted to alternative means of irrigation i.e., groundwater through bore wells.

Today, wells are an important source of irrigation in rain-fed areas. Over the past 30 years, extraction of groundwater from wells has in many areas surpassed any natural replenishment. Many wells have as a result gone dry. Each year farmers have to go deeper and deeper to obtain a supply of water incurring huge costs. This has led to a rapid increase in farmers' indebtedness. The demand for groundwater is satisfied by those who have sufficient resources to construct tube wells and sell water to their neighbors. This has led to overexploitation of a common pool resource. The phenomenon appears to provide striking evidence to justify Garrett Hardin's well-known "tragedy of commons" thesis—namely, the uncontrolled access to common resources leads inexorably to its degradation.

GoAP introduced the Water Land and Tree Act (WALTA), which has a provision to regulate the uncontrolled use of natural resources. The act has not been implemented in its true spirit. The groundwater resources are mostly in individual control and not a community resource. In this context, APDAI has started a pilot for collective use of groundwater.

Activities and Indicators: The Groundwater initiative encourages farmers to come together, and to utilize the available groundwater resources collectively by pooling the water from all the existing bore wells under a transformer for sustainable use and management of water and use collectively in order to facilitate sustainable use of groundwater (Table 5.2).

Table 5.2: Activities, Practices and Indicators for Groundwater pilot

Activity	Practices promoted	Indicators
<ul style="list-style-type: none"> ▪ Evolving and enforcing social regulations on water sharing, regulation of sinking bore wells, etc. 	<ul style="list-style-type: none"> ▪ Sharing of groundwater among farmers from existing bore wells ▪ Preventing further exploitation of groundwater 	<ul style="list-style-type: none"> ▪ Additional area brought under cultivation: farmer-wise and season-wise ▪ Area received critical irrigation ▪ No. of farmers using sprinklers ▪ No. of new bore wells ▪ No. of farmers following crop-water budgeting and crop choices

⁴⁸ Tanks should be considered as one of the earliest expressions of indigenous knowledge systems in rainwater harvesting practices.

Process: The initiative was proposed in three villages namely Chellapur, Gundallapalli and Mukthipahad of Mahaboobnagar district. As on today, the pilot has been grounded in only in Chellapur. The initiative did not make much progress in the remaining two villages as it is taking longer time for organising communities in these villages. Hence the baseline data were collected only for Chellapur village. The process followed in the implementation of the pilot was as follows:

- Organising farmers in a pilot area into CIG
- Installation of distribution pipeline was installed for facilitating water from the bore well to the fields
- Linking farmers with government programmes for accessing sprinklers for efficient use of the groundwater
- Evolving social regulations on sharing arrangements, prioritizing water needs, providing critical irrigation, regulation of sinking bore wells, etc.
- Crop water budgeting exercise with farmers to facilitate water sharing and crop choices

BASELINE STUDY

Sample: Ground water initiative is implemented in one village (Chellapur) by VO by organizing five farmers into a CIG.

Methodology: Information was collected by organizing FGDs with CIG members and from all the individual farmers by using a questionnaire.

Time periods: The baseline period for the pilot is Kharif 2006.

BASELINE FINDINGS

Socio-economic characteristics of the sample: The pilot covers 5 farmers in Chellapur; and all of them belong to BC community. As regards literacy, the overall sample shows that only one member is literate.

Baseline status of indicators

The farmers have 54 acres of land in the area proposed under pilot, less than 10 % of which is irrigated (Table 5.3). Nearly three-fourths of the area is under rain-fed agriculture. The remaining area (18.5 %) is uncultivable waste.

Table 5.3: Total land owned under pilot area by irrigated area

Type	Area (in acres)	Percentage to total
Irrigated	5	9
Dry	39	72
Waste	10	19
Total	54	100

Bore wells: The CIG members own five bore wells in the pilot area; of which two are common bore wells. Thus, the CIG members have already been involved in sharing ground

water under two bore wells. As shown in table 5.6, all the bore wells were reported to be functioning. The average depth at which water is available in these bore wells works out to 52.4 feet. Further, on an average, water has been pumped for 600 hours per season. None of the farmers were reported to have used sprinklers or drip systems.

Table 5.4: Ground water availability

Particulars	Water level (in feet)	
	Average	Range
Water level	52.4	50-60
Bore well depth	126	120-130
Water pumped per season	600	600

Cropping pattern: The crops grown during kharif 2007 were chili, green gram, red gram, groundnut, Jowar and sesame (table 5.7). In addition, paddy was grown under bore wells. It may be noted that more area was under red gram followed Jowar, green gram and paddy. Equal proportion of area was under chilly, sesame and groundnut. In fact, 7.5 acres was kept fallow in Kharif-2007. The data also show that during the rabi of 2007-08 farmers have cultivated castor and groundnut. Altogether, the total area cultivated during rabi was 10.5 acres.

Crop yields: The yield per acre is 11.8 quintals per acre for paddy, 1.8 quintals for chilli and 1.2 quintals for red gram. The yields for Jowar, green gram and vegetable crops were low on account of crop failure.

Table 5.5: Cropping pattern in kharif 2007-08

Crops	Number of farmers	Area (acres)	Yield	Average yield per acre
Chilli	2	1	1.8	1.8
Fallow	5	7.5	0	0
Greengram	4	6.5	3	0.5
Groundnut	2	1.5	3.6	2.4
Jowar	4	6.5	3	0.5
Paddy	5	5	59.1	11.8
Redgram	5	15.75	18.5	1.2
Sesame	2	1.5	1.5	1.0
Vegetables	1	0.5	0.3	0.6

Crop Economics: The farmer has on an average incurred expenditure of Rs.3573 per acre and an average revenue per acre of Rs. 4321 (Table 5.6). The expenditure and revenue varies across the different crops, which is lowest for Jowar (Rs. 1504) and highest for Paddy to Rs. 5140).

Table 5.6: Average income and expenditure per acre for different crops (Kharif 2007)

Crop	Total area (in acres)	Yield per acre (in Quintals)	Expenditure	Revenue	Net income
Chillies	1.5	2.1	5140	5950	810
Green Gram	6	0.5	2362	1391	-971
Ground Nut	1.5	2.4	5373	5793	420
Jowar	6	0.5	1504	1128	-376

Paddy	5	11.8	5090	9243	4154
Red Gram	15.75	1.05	3060	4090	1030
Sesame	1.5	1	2482	2650	168

The average net income derived by the farmer is Rs. 747 per acre. The net income was higher for paddy, followed by red gram and chilies. The farmers have incurred loss in the case of green gram and Jowar, due to lack of rains, diseases and growth of weed.

Table 5.7: average income per-acre of land

Particulars	Average amount (in Rs.)	Range
Expenditure	3573	1504 -5140
Revenue	4321	1128-9243
Net income	747	-971-4154

The baseline status of indicators is given in Table 5.8.

Table 5.8: Baseline status of indicators related to Ground water: Mahaboobnagar

Indicators		Baseline status
Functioning of CIG		NA
Area under cultivation	Kharif	46
	Rabi	11
Area received critical irrigation		0
Number of farmers using sprinklers		0
Number of new bore wells		5
Number of farmers following on crop-water budgeting		0
Net income per acre (in Rs.)		747

Supportive Government programmes: The Government of AP provides support to SCs and STs to dig community bore wells. APMIP provides sprinkler irrigation on subsidized costs.

CHAPTER 6: SUMMARY AND CONCLUSIONS

POVERTY AND VULNERABILITY

Incidence of poverty: Both districts have a relatively large percentage of poor households⁴⁹, although Mahaboobnagar at 41% has a slightly higher proportion of poor households than Anantapur at 34% (Table 6.1). Across the 16 habitations of Anantapur, however, the incidence of poverty ranges from 6.25% in Bonepally to 70% in Zurukuvari pally. It can be further noted that 7 out of 16 habitations register poverty incidence less than the aggregate figure of 34 per cent.

Table 6.1: Distribution of poor households

District	Total households	Poor house holds	Percentage to Total
Anantapur	1,510	513	34
Mahaboobnagar	8,079	3,279	41
Total	9,589	3,792	40

Poverty and vulnerability: As per the information provided by the village authorities, the incidence of poverty is higher at 40 per cent in the study area as compared to the corresponding figure of 11 % for the state as a whole. Across habitations constituting the study area, four habitations register less than 10 per cent incidence, while three habitations on the other extreme have incidence higher than that prevailing at the aggregate level. Of these, Gundlapalli which is inhabited by the SCs alone, registers the highest incidence of 70% poverty.

Excluding 141 landless households, there are 9,496 landholdings in the study area of whom marginal farmers is the major group with 55 per cent, distantly followed by marginal farmers with a corresponding figure of 28 per cent. Medium and large farmers also constitute the group with 14% and 3 % respectively.

COMMUNITY-LEVEL DROUGHT MANAGEMENT

In all the villages people mentioned that there was no specific support from any village institution to face drought risks. Even the loans provided by SHGs and VOs were not specially linked to drought risks. Thus there are no community level mechanisms to face a drought.

The APDAI interventions are therefore timely and appropriate, but the performance of each pilot has to be measured against this baseline situation.

⁴⁹ Those with per capita income less than Rs. 293 per month are considered to be below poverty line (BPL).

APPENDIX 1: Terms of Reference for Monitoring, Evaluation and Learning (ME&L) Consultancy

I Background

The mitigation of the impacts of drought has been a key area of focus of the Government of Andhra Pradesh (GoAP). Responses to drought risks need to be planned at small geographic scales taking into account both short-term and long-term effects of drought management strategies.

The AP DAI pilot project is being implemented by the Society for Elimination of Rural Poverty (SERP) in collaboration with district collectors in the pilot districts, and under oversight of Principal Secretary, Department of Rural Development through the office of the Commissioner, Rural Development. Phase I of the pilot program (June 2006–April 2007) initiated activities in 6 villages in three mandals of Mahaboobnagar District. A village-level (generic) baseline survey was also carried out in these 6 villages. Phase II of the pilot implementation planned to start in November 2007 to expand the project into an additional 9 villages in Mahaboobnagar and initiate activities in 10 new villages in the Anantapur District. While pilot activities under Phase II have been initiated in these 9 villages in Mahaboobnagar District, work has not yet begun in Anantapur District. The implementation of AP DAI Phase II is supported jointly by Government of Andhra Pradesh (GoAP) funds and the Japan PHRD Climate Change Initiative Grant (CCIG) of the World Bank.

These TORs are for consultancy services of a Monitoring, Evaluation and Learning Agency which will be responsible for the provision of technical assistance services for monitoring the performance of Phase II of the DAI activities, in coordination with partner agencies involved in AP DAI.

II Project Objectives

The overall objective of the Andhra Pradesh Drought Adaptation Initiative (AP DAI) is to enhance drought adaptation capacity of the most vulnerable groups within affected rural communities and to reduce their vulnerability to drought in the long-term. Specifically, the AP DAI pilot focuses on the following objectives: (i) identify gaps and missing links in the on-going drought-related programs and activities in the select rural communities of AP; (ii) facilitate integration of different programs and institutional mechanisms for delivering drought-related assistance to these communities; (iii) design and test innovative methods, institutional mechanisms and instruments for helping selected communities to adapt to drought; (iv) improve awareness on drought adaptation options and approaches; and (v) disseminate the results of the pilot efforts and build support for wider replication.

III Project Contents and Approach

Areas of Intervention: Phase II of the AP-DAI will continue focusing its resources on five areas of interventions:

Management of natural resources with an emphasis on community level (*ground*) *water management* and *management of common land*;

Production systems with an emphasis on diversification and intensification in agriculture, horticulture, livestock and fisheries and technology innovation;

Marketing, institutional and economic instruments with special emphasis on improved access to marketing systems and financial services, and on innovative drought adaptation risk financing schemes;

Institutional support and capacity building that includes community mobilization and awareness and knowledge sharing

NRM-derived diversification of local economic activities and livelihood options;

Pilot villages for Phases I and II have been selected based on the criteria jointly agreed between GoAP and the World Bank and include presence of (a) active and relatively well organized community institutions, such as SHGs and farmers' associations/societies; and (b) relevant on-going programs (AP RPRP, NREGS, DFID-APRLP, and UNDP South Asian Poverty Alleviation project). The pilot program will be implemented at the local level by community based organizations with support of extension agencies, NGOs and experts facilitated by the lead technical agency under the guidance of Departments of Rural Development.

Scope of Work

The experience derived from Phase I of the project is that all the pilot activities, even when emphasizing a single issue (e.g. groundwater sharing or fodder bank), need to be implemented in a package of interrelated activities. This is a reflection of the fact that successful drought adaptation cannot be based on a single intervention but must be based on a package of interrelated interventions that, taken together generates the changes in the natural resource based production system which renders it more resilient to drought conditions. Further, the packages of technical solutions need to be accompanied by adequate institutional support and service delivery modules to ensure successful implementation and sustainability. However, since each pilot is typically focused on a small group of primary stakeholders, and is not related to other pilots, this inter-relatedness has to be addressed while drawing recommendations for scaling-up of the pilot.

Phase I of the project has demonstrated the importance of a comprehensive monitoring and learning (ME&L) system to assess the effectiveness of the pilot initiatives adopted, learn from the processes at the community level, improve project design and mobilize support. A consultancy support is therefore needed to work with the Lead Technical Agency (LTA) in AP DAI to assess progress on the ground and provide regular feedback to the LTA on the technical, economic and institutional aspects of the implementation of each pilot. The ME&L consultant shall perform the following tasks:

Village-level Baseline Surveys: Since a village-level baseline survey has already been conducted in 6 villages in Mahbubnagar during Phase I, fresh village-level baseline surveys have to be conducted in 9 villages of Mahaboobnagar district and in 10 villages of Anantapur district. The baseline survey will be shorter and more focused than those conducted in Phase I and designed to collect essential background information on each village to provide a context for the pilots to be implemented in each village. It will therefore cover issues such as demography, land use, status of water bodies, migration, occupational status, community-based organizations, livestock, trends in resource use traditional resource management strategies, stress faced during droughts and coping strategies and development programs implemented in the village. The ME&L consultant will provide the necessary methodology, schedules/formats and orientation of field staff. The baseline survey shall be preceded by the development of log-frame and general outcome/output indicators. This component of the work can be based on the baseline approach developed for the six first villages in Mahaboobnagar district prepared during Phase I. The approach and methodology, including the field formats, will be discussed with the LTA and GoAP representatives before the survey begins. The data will have to be quality checked, entered into a computer database, and analyzed, and the findings presented in a concise report in an agreed format.

Pilot-specific ME&L: All pilots in the 25 villages, including the 10 villages to be selected in Anantapur, are to be assessed at two points of time during the course of the project: (1) October-November 2008, after the kharif season (June – October); and (2) March-April 2009, after the rabi season (November – March). During each of these three assessments, the ME&L consultant will spend around one/two days per village, collecting information on technical, economic, institutional and process aspects of each pilot.

November 2008:

Technical and economic data on production in kharif 2008 and in kharif 2007 (based on recall)
Process information on (1) viable institutional mechanisms tried since inception; (2) problems faced and overcome; and (3) suggestions for sustainability and future improvement

April 2009:

Technical and economic data on production in rabi 2008-9 and in rabi 2007-8 (based on recall)
Process information on (1) viable institutional mechanisms tried since inception; (2) problems faced and overcome; and (3) suggestions for sustainability and future improvement

The assessment in November 2008 may take more time, given that (a) the field formats will be new and (b) information on two cropping seasons is to be collected. However, the assessment in April 2009 is likely to take less time (than the two days allocated) since the field teams will be familiar with the formats and only one season's cropping information is to be collected. Overall, therefore, the allocated time of two days per village is likely to be sufficient.

Pilot-specific formats will be developed shall be related to the objectives of each pilot with regard to technical, economic and institutional issues. Process information will also be captured through structured focus group discussions with pilot participants at these times. The formats will capture technical advantages/problems to be learned from the pilot, differences in output from the initiative as compared to business as usual, economic results/performance of the pilot initiative and institutional (organizational and management) aspects of the pilot. In addition, the pilot level ME&L system will identify and capture issues, specific to each pilot initiative, deemed necessary to understanding the feasibility for up-scaling the pilot initiative. A set of key technical and institutional issues to be covered by each pilot-specific ME&L format is in Annexe 3. Further, since pilot initiatives will also be initiated in villages other than the ten selected target villages in Anantapur, these pilot initiatives shall also be monitored as per the pilot specific ME&L system.

The ME&L consultant will develop detailed pilot-level ME&L formats in close coordination with the LTA and the AP DAI Cell, based on draft formats which will be made available. Please refer to Annexes 3 and 4 for more details on the preparation of the pilot-specific formats.

Learning Workshops: Along with the LTA, the ME&L consultant shall facilitate the setting up of learning groups, comprising MMS members and project partners, to discuss project progress. The ME&L consultant will also provide feedback on the progress of pilot implementation at least after each round of field visits and on the outcomes of the learning groups. A minimum of four learning group events will be held from June 1 2008 to June 30, 2009.

IV Technical Expertise Required

The Consultant team's expertise should comprise the following areas:

- ✓ Agriculture, livestock and rural development, with experience in community-driven development programs
- ✓ Social development, with expertise in the use of participatory methods
- ✓ Statistical and data analysis

A detailed description of the main technical positions in the consultant team is attached in Annexe 1.

VI Expected Outcomes

- ✓ Creation and use of an ME&L system that tracks evolution and maturity of DA packages and assesses the effectiveness of interventions made through the pilot project
- ✓ Regular feedback to the project management at the state and district levels on the progress of the pilot, to improve implementation and facilitate internal learning.
- ✓ Sharing of experiences among the key stakeholders and users at all levels (State, District, MS, GP/VO, village and SHG) and improved communication across the stakeholders on the project objectives and outcomes.
- ✓ Consolidation of monitoring results, outcomes and lessons learned from the AP DAI pilot.

VII Implementation Arrangements

The Monitoring and Evaluation Agency will report to the Project Manager in the AP DAI cell in the office of the Commissioner, Rural Development (CRD) and SERP. The Consultant will ensure that the ME&L aspects will be undertaken in close partnership and through a continuous consultation process with the Lead Technical Agency, other resource agencies involved in pilot implementation,

District Collectors and mandal and village level authorities and organizations, other relevant government agencies and local communities.

VIII Duration of consultancy

The consultancy is expected to commence on June 1, 2008 and will be completed on June 30, 2009.

IX Data, Services & facilities to be provided to the Consultant

The consultant will be facilitated in securing information like topo-sheets, census data, and district/mandal/state level information as may be required for the project. The consultant will also be provided access through the APDAI cell, to various departments at state, District and Mandal level, and to facilities in the offices of the concerned Project Directors (District Water Management Agency) and the office of the Commissioner (Rural Development) for matters related to APDAI

X Reporting and Schedule

A schedule for reporting deliverables is provided in Annexe 2. All final deliverables acceptable to the Bank will be provided by the Consultant in colour hardcopy (10 copies) and electronic form using common office software (e.g. MS Word, MS Excel, Arch Info). Financial statements will have to be submitted upon a schedule defined by SERP.

XI Review Committee

APDAI Cell will monitor the day-to-day implementation of the pilot with the help of district coordinators deployed for the purpose. Concerned officials from SERP will review the work of the ME&L Agency on half yearly basis starting from July 2008. The District Water Management Agency (DWMA) of the concerned district may periodic review progress with the ME&L consultant. In addition, a State Level Management Committee under the Chairmanship of the Principal Secretary, Rural Development, will provide guidance on policy issues.

APPENDIX 2: Details of the Village Sample

MAHABOONAGAR DISTRICT

Mandal	VO based in	Number of SHGs in the VO	Habitations under VO	Gram Panchayat of Habitation
Kosigi	Lodhipur	8	Lodhipur	Lodhipur
	Gundlapally	3	Gundlapally	Gundlapally
	Mukthipahad	8	Mukthipahad	Mukthipahad
	Chennaram	9	Chennaram	Chennaram
	Bijjaram	15	Bijjaram	Bijjaram
Bommarajpet	Chowderpally	20	Chowderpally	Chowderpally
	Kotture	30	Kotture	Kotture
	Nagireddypally	9	Nagireddypally	Nagireddypally
	Bomraspet	45	Bomraspet	Bomraspet
Daulatabad	Gokafaslabad	42	Gokafaslabad	Gokafaslabad
	Doultabad	60	Doultabad	Doultabad
	Neetur	24	Neetur	Neetur
	Antharam	30	Antharam	Antharam

Note: Thimmareddypally and Chellapur Gram Panchayats were dropped by the implementing MMSs.

ANANTAPUR DISTRICT

Mandal	VO based in	Number of SHGs in the VO	Habitations under VO	Gram Panchayat of Habitation
Gandlapenta	Veparala	22	Chervu Mundara Thanda	Veparala
			C.M.H.W.	
			Veparala	
			Kalakalya	
	Kattivaripalli	18	Kattivaripalli	Tupali Somayajulapalli
			Yenumulavaripally	
			Munagalavaripally	
	Dwaranala	30	Juruguvaripally	Katarupalli, Maddevarigondi
			Dwaranala	
			Muddannagaripally	
			Nallasanivaripally	
			Dasarivandlapally	
			Kotapally	
			Maddivarigondi	
Katarupallycrass				
Gaggalavandlapally				
Vepalakunta	9	Vepalakunta	Somayajulapalli	
Kurumamidi	9	Kurumamidi	Kurumamidi	
		Chinnakayyagaripally		
		Guttikindipally		
Nallacheruvu	Gorantlavaripally	22	Gorantlavaripally	Ubicherla
			Gorantlapally	
	Oruvai	18	Pallevandlapally	Oruvai
			Dodinepally	
			Oruvai	
	Devireddipalli	8	B.Ramanappagaripally	Tallamarlavandlapalli
			Devireddipalli	
	Balepallithanda	16	Balepally Eguva Tanda	P. Kottapalli
Balepally Diguva Tanda				

Note: Ratnalapalli habitation in Gram Panchayat Allugundu was dropped by the implementing MMSs.

APPENDIX 3: Generic Baseline Survey Format

1. Basic Information

1.	Name of the Habitation	
2.	Name of the Gram Panchayat	
3.	Name of the Mandal	
4.	Name of the District	
5.	Number of households	1) Total no. households: _____ 2) No. BPL households: _____

2. Connectivity of the village to near by town

Distance to Mandal Hqs.	Bus facility (yes/no)	Frequency of bus facility per day (no.)	Pvt transport availability (yes / No)	Road 1. Kachha 2. earth road 3. metal road 4. tar road

3. Demographic profile

	Caste	Total number of households
1	S.C	
2	S.T	
3	B.C	
4	O.C	

4. Land use pattern (similar to Output Format – Point 4 in Format 2)

	Area in acres	Number of dependent households
Total geographical land		
Total cultivated land		
Total land cultivated in <i>kharif</i>		
Total land cultivated in <i>rabi</i>		
Total land cultivated in summer		
Total forest land (Reserve Forest)		
Total revenue land		
Total common grazing land		
Total Panchayat wasteland		
Current fallow land		

5. Landholding particulars (in acres)

		Own / Patta	Assigned
1	Area (acres)		

2	No. of farmers		
3	Leased in (acres)		

6. Cropping pattern

Season	Now									Past (reference period 1980)								
	Major crops			Minor crops			Inter-crops			Major crops			Minor crops			Inter-crops		
Kharif																		
Rabi																		
Summer																		

Codes: (a) Paddy-1, Ragi-2, Chillies-3, Sugarcane-4, Onion-5, Tomato-6, Jowar-7, Groundnut-8, Sunflower-9, Red gram-10, Castor-11, Bajra-12, other millets (Korra, Saidulu)-13, Horsegram-14, Greengram-15, Black gram-16, Bengal gram -17, Coriander-18, Maize-19, Wheat-20 Cotton-21, Tobacco-22, Mulberry-23, Orange-24, Lime-25, Mango-26, Guava-27, Ber-28, Pomegranate-29, Floriculture-30, any other (specify)-31

7. Agriculture equipments and allied activities

Major agricultural equipment in the village			
Tractors	Pump sets	Threshers	Power sprayers

8. Allied agricultural activities in the village

Flour / grinding mills	Rice mills	Storage godowns	Milk collection centers	Food processing units

9. Occupational profile

9.1 Number of farm households	Landless	Marginal	Small	Medium	Large

9.2 Number of households with livestock	Cows	Buffaloes	Goats	Sheep	Draught animals	Poultry

9.3 Number of women-headed households	Widow	Separated	Divorced	Husband ill	Husband in long term migration (more than 6 months)

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9.4 Number of households migrating	Full year	Seasonal	Short time

9.5 Number of households with members employed full-time in nearby towns (daily workers)	
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10. Livestock profile (collect from villagers / veterinary doctor)

Category	Number	Category	Number	Category	Number
Bulls		He buffaloes		Sheep	
Cows		She Buffaloes		Goat	
Calves (below 1 year)		Heifers (1-3 years)		Poultry birds	

11. Water bodies and infrastructure (with trends of resource use)

Sl. No.	Particulars	In 2008-09	
		Number	Extent (acres)
1.	Bore wells		
(a)	Functioning		
(b)	Non-functioning		
2.	Open wells		
(a)	Functioning		
(b)	Non-functioning		
3.	Canals		
4.	Tanks		
5.	Ponds		
6	Ground water level (in feet from the surface)		

12. Trends in resource use (Collect data using recall method)

		20 years ago	10 years ago	Current	Major reasons for trend
1	Cultivated land (large farmers) (acres)				
2	Cultivated land (small & marginal farmers) (acres)				
3	Wasteland (acres)				
4	Forest land (acres)				

5	Community tank (no.)				
6	Open wells (no.)				
7	Bore wells (no.)				
8	Groundwater level (in meters from the ground)				

Codes for resource use: 1-more than current level; 2-much more than current level; 3- same as current level; 4 -less than current level; 5-much less than current level

Codes for reasons: 1-more human population, hence more use; 2-more population + more water-using crops; 3 -more livestock; 4 -more water-using livestock; 5-less rain; 6-more borewells being dug; 7 - existing borewells being deepened, etc; 8 -Other (specify)

13. Nature of stress faced during drought & coping strategies of different groups

Category	Stress (a)	Coping strategies (b)		Narration
		old	New	
Small and marginal farmers				
Landless households				
Goat reares				
Sheep reares				
Women headed households				
Disadvantaged groups*				
Traditional crafts persons**				

* Physically & mentally disabled, chronically-ill

** Blacksmith, weavers, artists, etc.

(a) Obtain information from farmers on the following stress conditions such as scarcity, emergency, shortage and distress.

(b) 1- Reduce quantity of meals for all 2- Reduce quantity of meals for girls 3- Reduce quantity of meals for elderly women 4- Reduce quantity of meals for adult women 5- Reduce quantity of meals for adult women 6- buy on credit from trader 7- borrow to buy food from money lender 8- borrow from family members 9- borrow from SHG 10- borrow from employer 11- Borrow from relatives 12 – Borrow from formal institutions 13- sale of land 14- sale of livestock 15-Any other

14. Community-Based Organizations (collected from MC / MMS)

Name of CBO	Number of groups	Members		Nature of support provided to members in drought	
		Male	Female	General	Specific
VO					
SHG					
RMG					
Labour Groups					
Youth Clubs					
Others					

15. NGOs working in the village (collected from MC / MMS)

Name(s)	Since when	Area of engagement (a)	Special groups formed for this work

1-micro-credit 2-Health 3-Education 4-NRM 5-others (specify)			

16. Development programmes implemented in the village at present

	Name of Programme	Name of Implementing Agency (1-NGO 2- Govt Dept 3-others)	No. of beneficiaries	Remarks
1	IAY (Indira Awas Yojana) / Indiramma Houses			
2	APREGS			
3	Indira Kranthi Patham (IKP) / Velugu			
4	Watershed program			
5	Old age pensions			
6	Widow pensions			
7	Disability pensions/ other benefits			
8	CFM/ JFM			
9	PMRY/ other employment programs			
1	Any other (specify)			

APPENDIX 4: PILOT- SPECIFIC QUESTIONNAIRES

I. DIVERSIFIED FARMING SYSTEMS

1. General information

1.1 Village	1.2 Mandal	1.3 District

2. Basic information about respondent

2.1 Name of the respondent	2.2 Name of the head of family	2.3 Caste (a)	2.4 Literacy of farmer	2.5 Operational Landholding (in acres)		
				Wet Land	Dry land	Total land
<i>(a) 1-SC, 2-ST, 3-OBC, 4-OC</i>						
<i>(b) 1-Illeterate, 2- Semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-College</i>						

3. Crops grown by the farmers (in acres)

Crop	Wet	Dry	Total
Kharif			
Rabi			
Summer			

4. Livestock possession

Category	Number	Category	Number
Bullocks		Sheep	
Cows		Goats	
Buffaloes		Poultry birds	

5. Area under DFS (in acres)

	Patta land	Assigned	Leased-in	Total land
Dry land				
Irrigated area				
Fallow				
Wasteland				
Total				

6. Plot-wise land Characteristics and soil Conservation Practices

Plot	Total	Source of	Water	Type	of	Soil	Soil	No.	Fodder	SMC
------	-------	-----------	-------	------	----	------	------	-----	--------	-----

Number	extent (acres)	irrigation (a)	supply method (b)	ownership (c)	type (d)	fertility (e)	of trees	on bunds 1- Yes 2- No	measures adopted (f)
<p>(a) 1-open well, 2-bore well, 3-in-well bore, 4-tank, 5-pond, 6-stream/ spring, 7-canal, 8-others(specify)</p> <p>(b) 1-drip, 2-sprinkler, 3-through pipe lines, 4-lined channels, 5-mud channels (flood irrigation)</p> <p>(c) 1-owned, 2-leased-in, 3-shared-in, 4-leased-out, 5-shared out</p> <p>(d) 1-black soil, 2- red soil, 3-saline soil, 4-alkaline soil, 5-sandy soil 6-any combination of the above, 7- any other (specify)</p> <p>(e) 1-very poor, 2-poor, 3-good, 4-very good</p> <p>(f) 0-not adopted any measure, 1-land leveling, 2-field bunds, 3-contour bunds, 4-trenches, 5-tree/grass plantation, 6-check dam, 7-farm pond, 8-others (specify)</p>									

7. Knowledge and adoption of DFS practices by farmers

Component	Prescribed norms	Aware of the practice Yes/No	Whether adopted Yes/No	Quantity (Number of units)	NREGA support Yes/No
1. Compost	1. Dimension of the pit				
	2. Glyricidia plantation				
	3. Number of times compost was filled				
2. crop Diversification	1. Multiple crops				
	2. Tree farming				
	3. Intercrop				
	4. Livestock				
3. Bund plantation					
4. Liquid manures	1. Panchagavya				
	2. Amruthajalam				
	3. Vermi-wash				
5. Tank silt					
6. Soil & Moisture conservation measures	1. Earthen bunds				
	2. Others				
7. NPM					

8. Crop management Practices

S.No.	Particulars	Practice	Code
1.	Cultivation method followed	1-single crop 2- inter-cropping 3- multi-cropping	
2.	Practice of crop rotation	1-yes 2-no	
3.	Procurement of seed	1-own 2-seed bank 3-farmer 4-market 5-Agriculture Research station	
4.	Seed treatment	1- yes 2-no	
5.	Bullocks	1. Own 2. Hired 3. Hired bullocks provided under APDAI 4. Tractor	
6.	Application of Chemical Pesticides/Insecticides	1. Yes, 2. No	
7.	What is the ratio of chemical and non-chemical inputs used by you	1. 100% chemical; 2. 75 % chemical and 25 % non-chemical; 3. 50:50 4. 25 % chemical and 75 % non-chemical 5. 100 % non-chemical	

9. Particulars of intercropping

Name of the crop	Time of sowing	Quantum of seed	Whether ploughed or not (Yes/No)	Spread over surface during dry spells (yes/No)	Crop harvested (Yes /No)	Total yield (in Kgs)

10. Support by different institutions

Institution	Technical support*	Training and extension*	Credit*	Linking to Subsidized Inputs*
VO				
MMS				
Agriculture department				
Village activist				
Others (specify)				
* 1.Yes 2. NO				

11. Linkages with government programs (1. Yes 2. No)	Seed	Fertilizers	NPM	Implements	Trainings/ extension support

12. Crop Economics

Major crop grown	Area (in acres)

12.1 Cost of cultivation

Human Labour

Activity	Men				Women			
	Person Days	Own	Hired	Rate / day	Person Days	Own	Hired	Rate / day
	1	2	3	4	5	6	7	8
Land preparation								
Sowing								
Weeding								
Top dressing								
Irrigation								
Fertilizers Application								
Insecticide/NPM								
Harvesting								
Threshing, Cleaning & Storage								

Bullock labour and Material cost

	Person days	Bullock Labour			Days	Tractor Rate/day	Material			
		Own	Hired	Rate / day			Details	Quantity	Own	Rate
	9	10	11	12	13	14	15	16	17	18
Land preparation										
Sowing										
Weeding										
Top dressing										
Irrigation										
Fertilizers Application										
Insecticide/NPM										
Harvesting										
Threshing, Cleaning & Storage										

12.2 Revenue (Units: quantity in quintals and price in rupees)

Name of crop	Main Product				By product 1		By product 2	
	Total Quantity	Quantity not sold	Quantity sold	Price	Quantity	Price	Quantity	Price

13. Immediate benefits accrued by farmers

Practice	Benefits	Response
1. Compost	1. Number of times compost was harvested	

	2. Whether compost was applied in farm (Yes /No)	
	3. Compost sold (Yes/No)	
	4. Biomass generated by growing sun hemp (in Kgs)	
	5. Depend on others sources for biomass (Yes/No)	
2. Crops and plantation	1. Survival rate of plant species (Number)	
	2. Fodder produced (in Kgs)	
	5. Millets produced (in Kgs)	
	6. Cereals produced (in Kgs)	
	7. Pulses produced (in Kgs)	
3. Green manure	1. Whether crop survived even after delayed rains (yes/No)	
4. Employment from EGS	1. Own labour (number)	
	2. Other than family labour ((number)	
	3. EGS payment in Rs.	

14. Replication of practices

13.1 Did you extend use of DFS practices to other areas also? 1. Yes 2. No	
13.2 If yes give extent of area (in acres)	
13.3 Two main reasons for not extending to other areas (1- Lack of land 2- Not seen any benefit 3- marketing of crop produce is a problem 4-higher costs for weeding and cultivation)	
13.4. Would you recommend DFS practices to fellow farmers? Code: 1. Yes 2. No	
13.5 If Yes to above question, give reason (1- Improve soil fertility 2- coping drought 3- improved yields 4-any other-specify)	
13.6 If No, give reason (1- Difficult to convince farmers 2- Not seen any benefit 3- any other- specify)	
13.7 Are you willing to continue with practices conditionally or voluntarily? Code: 1- Conditionally (with support from project) 2- Voluntarily	
13.81 If conditionally, what are the conditions? (1- continued inputs subsidy 2- quality seed 3- Free supply of equipments 4- Linkage with REGS 5- Technical guidance 6- Any other)	

15. Problems and constraints faced by farmer

	Problems	Rank
1		
2		
3		
4		
	Constraints	
1		
2		
3		
4		

16. Suggestions for improving the pilot

	Suggestions	Rank
1	Need to ensure supply of quality seed	
2	Require proper trainings and handholding support	
3	Essential to give compensation and subsidy for new crops	
4	Provision for application of sufficient quantum of silt	
5	Any other (specify)	

II. PLOUGH BULLOCKS

1. General Information

1.1 Name of the Village	1.2 Mandal	1.3 District

2. Basic information about respondent

2.1 Name of the respondent	2.2 Name of the Head of family	2.3 Caste (a)	2.4 previous Experience in similar activity	2.5 Literacy of the respondent (b)
<i>(a) 1-SC, 2-ST, 3-OBC, 4-OC</i>				
<i>(b) 1-Illeterate, 2- Semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-College</i>				

3. Information about activity

Date of starting activity	Did you sign contract with VO?	When did you get animals	Number of animals provided by VO	Implements provided by VO 1. Bullock cart 2. others	Number of installments paid to VO	Amount paid to VO

4. Participation in related events/activities

S. No	Process	Aware	Participated 1.yes 2. No	If no, reasons
1	Agreement with VO			
2	Member in purchasing committee			
3	Orientation on activity			
4	Minimum work days per annum			
5	Plough lands of poor on priority basis			
6.	Membership in Fodder Bank (80 days)			
7.	Vaccination of animals by member			
8	Insurance of animals by VO			
9	Right on FYM –member			

5. Draught animals owned by household	Own (nos.)	Provided by VO (APDAI) (nos.)
Before Project intervention		
After Project intervention		

6. Number of family members depending on the ploughing activity

Before Project intervention	
After Project intervention	

7. Number of days ploughing activity was carried out (provided by VO)

	Own	Rent	In Exchange	Others	Rate per day	Total amount earned
Before Project intervention						
After Project intervention						

8. Purpose for which animals were used (no of days between June and May)

	Ploughing	Silt-application	Transport of manure	Watering plantation	Others
Before Project intervention					
After Project intervention					

9. Member's involvement in work allocated by VO (Verify records and enter the details)

Total work allocated by VO (in days)	Assigned work done (in days)	Number of marginal farmers covered

10. Fodder shortage

Did you face any fodder shortage	1. Yes 2. No
Before Project intervention	
After Project intervention	

11. If Yes to 10, then how did you manage

	Migrated	Purchased others from	Fodder bank	Returned animal to VO
Before Project intervention				
After Project intervention				

12. Economics of the activity

S. No	Particulars	Before Project intervention Amount (in Rs.)	After Project intervention Amount (in Rs.)
1	Revenue		
	Total work days of animals x rate		
	Income from dung		
2	Expenses		
	Cost of fodder		
	Vaccination/health		
	Farm equipments		
	Shed		
	Amount repaid to VO		
3	Profit (1-2)		

13. Whether you have continued the activity in second and subsequent years (1. yes 2.No)?

14. If discontinued, give reasons

15. If VO has terminated contract, specify reasons

16. Problems and constraints faced by farmer

17. Give suggestions for improving the activity

III. SEED BANK

1. General information:

1.1 Village	1.2 Mandal	1.3 District

2. Basic information about respondent

2.1 Name of the respondent	2.2 Name of the head of family	2.3 Caste (a)	2.4 Literacy (b)
<i>(a) 1-SC, 2-ST, 3-OBC, 4-OC</i>			
<i>(b) 1-Illeterate, 2- Semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-College</i>			

3. Why do you think you have been selected for the activity?

Membership In CBOs (a)	PoP member	Knowledge of agriculture	Ability to communicate	Any other (specify)
<i>(a) 1- SHG member 2. SHG leader 3-VO leader 4-Office bearer of MMS 5. any other (specify)</i>				

4. When did you start seed bank?

	Month	Year

5. Selection of crops for seed bank

<i>1. Decided in Gram sabha 2. Suggested by VO 3. Suggested by technical agency 4. Decided in farmers meeting 5. Any other (specify)</i>	
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6. Material and equipment received from project (1. No 2. Yes)

storage bins	Drying mats	Weighing machine	Measures	Graders	Packing machine	Packing material (e.g., bags)	Any other (specify)

7. Storage space for seed bank was provided by

<i>Code: 1- Entrepreneur 2- VO 3- GP 4- Taken on rent 5- any other (specify)</i>	
--	--

8. Estimated seed requirement (in Kgs)

Millets		Pulses			Oil seeds			Others	
Sorghum	Minor millets	Pigeon pea	Black gram	Green gram	Castor	Seasumum	Ground nut	Fodder	Vegetables

9. Quantum of seed distributed by entrepreneur from-----to..... (in Kgs)

Particulars	Millets			Pulses			Oil seeds			Others
	Sorghum	Minor millets	Pigeon pea	Black gram	Green gram	Castor	Seasum	Ground nut	Fodder	Vegetables
Type of seed										
Quantity 1-Local 2-improved 3-HYV										

Particulars	Millets			Pulses			Oil seeds			Others
	Sorghum	Minor millets	Pigeon pea	Black gram	Green gram	Castor	Seasum	Ground nut	Fodder	Vegetables
Source*										
Rate										

*1-Research stations 2- Market 3- Fellow farmer 4-seed repaid by farmers 5-seed producers 6-others

10. Have you taken up seed production activities by involving farmers

(Code: 1.yes 2. No)

--	--

11. How many villages and farmers did you supply seed?

Number of Villages	Farmers with in village			Farmers outside village		
	Sold	Nagupadhathi	Total quantity	Sold	Nagupadhathi	Total quantity

12. If you have provided seed in Nagupadhathi, provide the following details

Proposed ratio of repayment (Code: 1- 1:2, 2-1:1.75, 3-1:1.5, 1:1.25, 5-1:1)	4-	Seed repaid by farmers (in Kgs)	
		In kind	In cash

13. Capacity building activities attended by entrepreneur

Seed bank management	Technical aspects	Storage	Marketing	Exposure visits

14. Books maintained with regard to seed bank

Who maintains books? (a)	Records and Books maintained (1. yes 2. No)			
	Stock register	Issue and recovery register	Bill books	Vouchers

Code: (a) 1-entrepreneur 2- Village Activist 3-VNA 4- Others (specify)

15. Support received from different institution

Institution	Extent to which support was rendered*	Narration
Agricultural department		
Research stations		
Village activist		
MMS		
VO		

* 1-To large extent, 2-Partially 3-Not at all

16. Economics of the activity

Cost of seed procured	Rent for storage place	Cost of labour	Cleaning cost	Packing cost	Quantum of seed distributed	Quantum of seed repaid	Profit after the cycle	Share of entrepreneur	Share of VO

17. Problems and constraints faced by Entrepreneur

18. Suggestion for improving the activity

IV. LIVESTOCK HEALTH SERVICES (VACCINATION)

1. General information:

1.1 Village	1.2 Mandal	1.3 District

2. Basic information about respondent

2.1 Name of respondent	2.2 Name of the head of family	2.3 Literacy of farmer (b)	2.4 Caste (a)
<i>(a) 1-SC, 2-ST, 3-OBC, 4-OC</i>			
<i>(b) 1-Illeterate, 2- Semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-College</i>			

3. Participation in events related to vaccination

S. No	Process	Aware 1-yes, 2- no	Participated 1.yes 2. No	If no, reasons
1.	Collection of indent by VA			
2.	Communication campaign			
3	Date of vaccination			
4	Payment for vaccination			

4. Particulars of livestock vaccinated (Collect information before and after project)

Category	Number of animals	Number of animals vaccinated	Type of vaccines	Amount paid (Rs.)		Number dead	Disease
				Vaccine cost	Services charges		
Bulls							
Cows							
He buffaloes							
She Buffaloes							

5. If some livestock were not covered by vaccination, give reasons

Not aware of vaccination date	Busy in work	Out of village	No Money in hand	Vaccination time was not appropriate

6. Perception about quality of service delivery and timeliness of service delivery

Particulars	Before project intervention	After Project intervention
Quality of service delivery (Code: 1-very satisfactory 2- satisfactory 3- not satisfactory)		
Timeliness of service delivery (Code: 1-No vaccination 2- Non-adherence to the vaccination 3- Always provided at appropriate time)		

8. How did the following institutions help members in accessing services?

Institution	Before - Extent to which help	After - Extent to which help was rendered*	Narration

	was rendered*		
VO			
SHG			
Village Assistant			
Veterinary assistant surgeon			
* 1. To a large extent 2. To some extent 3. Not at all			

9. How do you rate the performance of village Assistant?

(Code: 1-Unsatisfactory 2-Satisfactory 3- Very good 4- Good)	
--	--

10. Immediate benefits observed by farmers

Outputs	Response (1. Yes 2. No)
1. Prevention of disease	
2. Reduction unnecessary expenditure	
3. Time is saved	
4. Healthy animals	
5. Cultivated habit of regular vaccination	
6. Others (specify)	

11. Suggestions for improvement

V. BACKYARD POULTRY

1. Basic information about respondent

1.1 Name of the respondent	1.2 Name of the head of family	1.3 Caste (a)	1.4 Literacy (b)
<i>(a) 1-SC, 2-ST, 3-OBC, 4-OC</i>			
<i>(b) 1-Illiterate, 2- Semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-College</i>			

2. Birds purchased

Purchased from VO	Purchased from CRC	Taken on share cropping

3. Poultry status

Type of birds	Birds in the beginning	No. of birds purchased	Died as of now	Birds sold	Self-consumed	Progeny added	Birds Existing now

4. Have you received training on vaccination? 1. Yes 2. No

5. Whether birds were given regular vaccination? 1. Yes 2. No

6. Have you become member in VO run insurance activity? 1. Yes 2. No

6.1 If yes give following details

Insurance premium paid per bird	Number of birds insured	Number of birds died		Total Insurance amount received
		Predation	Disease	

7. No. of eggs produced

Type of birds	No. of birds	Eggs laid	Eggs sold	Place of marketing	Sold price per egg	Total Amount

8. Birds sold

Type of birds	No. of birds	Birds sold (where)	Birds used for self-consumption	Amount

9. Did you receive support from MMS/VO in Marketing

(Code: 1- Yes 2-. No)	
-----------------------	--

10. If yes, give details about nature of support

11. Problems faced by member in poultry

12. Suggestions, if any for improving the activity

VI. CHICK REARING CENTRE

1. General information

1.1 Village	1.2 Mandal	1.3 District
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2. Basic information about entrepreneur

2.1 Name of the respondent	2.2 Name of the head of family	2.3 Caste (a)	2.4 Literacy (b)	2.5 Position in VO/SHG/MMS (c)	2.6 Month and year of starting activity
<p>(a) 1-SC, 2-ST, 3-OBC, 4-OC (b) 1-Illeterate, 2- Semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-College (c) 1- SHG leader 2-VO leader 3-Office bearer of MMS 4. any other (specify)</p>					

3. Entrepreneur arrangement with VO

(Code: 1- VO pays wages for care taker 2-Enterprenuer takes loan 3- profit is shared equally between VO and entrepreneur 4- Any other (specify)	
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4. Information about chick rearing unit

1. Month and year of starting activity cycle	2. Size of unit (starting)	3. cost of chicks	4. transportation cost	5. Total cost of unit (3+4)	6. No. of Chicks died	7. Unit size at end of 45 days

5. Shed and equipments

1. Whether unit is located 1. Own place 2. rented place 3. Place provided by VO	Total area of shed (in sq. feet)	Equipments (1. yes 2. No)					
		Water tubs	Feeders	Brooders	Chick Guard	Mesh	Any other (specify)

6. Other input support for the centre

Particulars	Code	Response
Source of capital for the unit	1. VO 2. Own 3. other sources	
Availability of feed	1. Own preparation 2. Supplied by VO 3. Market	
Vaccination	1-very satisfactory 2 satisfactory 3-not satisfactory	
Linkages with AH dept	1-very satisfactory 2 satisfactory 3-not satisfactory	
Care taker time	Number of hours per day	

7. Chick mortality up to sixth week (Collect information from daily chart maintained in CRC)

Birds died in week 1	Birds died in week 2	Birds died in week 3	Birds died in week 4	Birds died in week 5	Birds died in week 6

8. Information about sales of birds (after six weeks)

Birds sold to VO (no.)	Birds sold to members (no.)	Given on sharing basis (pali) to members (no.)	Total birds sold (no.)	Average sale cost per bird (rs.)	Total amount from sales (rs.)

9. Economics of chick rearing centre

S. No	Particulars	Cost
-------	-------------	------

I.	Fixed cost	
	Cost of shed construction	
	Equipments	
II.	Running expenses	
1	Total cost of chicks	
2	Shed rent	
3	Feed cost	
4	Vaccination	
5	Care taker cost	
6	Interest on loan	
7	Others	
III.	Income from sales	
IV	Net incomes {III-(II+30 % of fixed cost)}	

10. Capacity building and technical support to entrepreneur

1. Vaccination	2. Feed	3. Management	Visit by VA (no of times)
Code for 1, 2&3: 1- Basic orientation 2- Guidance by VA 3- MRP 4- no support			

VII. REPLACING BREEDING RAMS IN SHEEP FLOCKS

1. General information

1.1 Village	1.2 Mandal	1.3 District

2. Background information about pilot

Total sheep rearing households in village	Sheep population in the village	Members involved in pilot

3. Give the following details relating to the group members

Name of the Person	Caste	Education	Number of sheep

Caste: SC / ST-1; Backward caste-2; Other Backward Caste-3; Forward caste-4; Minorities (Muslim, Christian, etc.)-5
 * Accounting for major proportion of the time in a year.

4. Have there been changes in the group membership?

Code: 1-New members joined; 2-Some members left; 3-Both; 4-None of the above	
--	--

5. How many members replaced breed in the flock?

Name of Member	Total size of flock	Number of breeding animals required	Number of animals replaced	Date of replacement	Survival status of breed animals

6. Mortality and increase in flock size

Name of Rearer	Starting		No of births		Died at birth	
	Adults	Kids	Pure	Mixed	Pure	Mixed
	1	2	3	4	5	6

Died 0-6 months		Flock size now		Additions		Depletion	
Pure	Mixed	Pure	Mixed	Births	Purchases	Sales	Death
7	8	9	10	11	12	13	14

7. What percentage of current flock is pure breed?

8. Support received from different institutions

Institutions	Extent to which the help was rendered (a)	Activity (b)	Narration
MMS			

VO			
AH department			
Para-vets			
Others			
(a) 1-To a large extent 2-Partially 3-Not at all			
(b) 1- training 2- credit 3- insurance 4- Vaccination 5- Purchase 0- nothing			

9. Whether you are provided with medical kit (1. yes 2. No)	
10. Did you vaccinate animals? (1. Yes 2. No)	

11. Any capacity building inputs received from the project (1. yes 2. No)

12. If yes, provide details

13. Immediate benefits observed by sheep rearers

Benefits	Response
1. Increase in weight of the sheep (age group comparison)	
2. Reduced Mortality	
3. Access to vaccination	
4. Access to insurance	
5. others (specify)	

14. Perception about problems and constraints of the project

15. Suggestions for improving the activity

VIII. GROUND WATER MANAGEMENT

1. General Information

1. Name of the Village	2. Mandal	3. District

2. Background Information about pilot

1	Date of establishment of the CIG	
2	Total members in the group?	
3	Total area covered by pilot	

3. Give the following details relating to the group members

Name of the Person	Caste (1-SC, 2-ST, 3-BC, 4-OC)	Literacy	Total land owned under pilot area			Irrigation facility 1. Yes 2. No
			Irrigated	Dry	Waste	

4. Participation in events related to Ground water

S. No	Process	Aware	Participated 1.yes 2. No	Work done	If no, reasons
1	Sharing arrangements				
2	Critical irrigations for rain-fed crops				
3	Area under fodder				
4	Rain gauge station				
5	Monitoring Ground water levels				
6	Crop-water budgeting				
7	Installation of pipeline for distribution of water				
8	Micro irrigation				
9	Water distribution (regulator person)				
10	Crop planning				

5. Plot-wise cropping pattern and water use

Plot name	Total extent (acres)	Irrigated under pilot	Crops grown	Water supply method (b)	Days allocated to farmer	Number of hours water provided (for each irrigation)	Total yield	Benefit (Grade)
Plot 1								
Plot 2								
Plot 3								

6. Pattern usage of bore-well

Bore-well	Depth at which water is	Type of motor/pump set	Horse power of the pump	Total number of hours	No. of times water	Ground water availability	Duration Rsted per

	available (ft.)	used (a)	set used (b)	pumped per season	scarcity faced during the last one year	at present (c)	month
1							
2							
3							
4							
5							
(a) 1-Jet motor, 2-Submersible motor, 3- Diesel motor (b) 1- 5 HP, 2- 7.5 HP, 3-10HP, 4- 12.5 HP (c) 1- good, 2- average, 3-poor, 4-very poor							

7. Change in the ground water situation over the last one year (1- worsened, 2-remained the same, 3-improved)

8. Number of wells/ bore wells dug over the last one year in the locality:

9. Availability and functioning of water distribution by regulator person

Services	Extent to which the help was rendered <i>1) To a large extent; 2)Partially; 3) Not at all</i>			Narration
	Regulatory person	Fellow Farmer	Village activist	
Regulator person in place				
Amount paid per month				
Crop choices				
Water sharing				
Maintenance and managing assets				
Conflict resolution				
Resting of bore wells				
Books and records				
Extension and education process				
Rain gauge station				
Sprinklers				
Agriculture equipments				

10. Immediate benefits observed by the farmers

Increase in Crop area	Critical irrigation for ID and rain fed crops	Less time spent on irrigation	Use of less water	Stop of new bore wells	Prevention of crop loss

11. Crop Economics (collect information for one main crop)

Major crop grown	Area (in acres)

11.1 Cost of cultivation

Human Labour

Activity	Men				Women			
	Person Days	Own	Hired	Rate / day	Person Days	Own	Hired	Rate / day
	1	2	3	4	5	6	7	8
Land preparation								
Sowing								
Weeding								
Top dressing								
Irrigation								
Fertilizers Application								
Insecticide/NPM								
Harvesting								
Threshing, Cleaning & Storage								

Bullock labour and Material cost

	Person days	Bullock Labour			Days	Tractor	Material			
		Own	Hired	Rate / day			Rate/day	Details	Quantity	Own
	9	10	11	12	13	14	15	16	17	18
Land preparation										
Sowing										
Weeding										
Irrigation										
Fertilizers										
Insecticide/NPM										
Harvesting										
Threshing, Cleaning & Storage										

11.2 Revenue (Units: quantity in quintals and price in rupees)

Name of crop	Main Product				By product 1		By product 2	
	Total Quantity	Quantity not sold	Quantity sold	Price	Quantity	Price	Quantity	Price

12. Linkages with other CBOs

13. Linkages with GP and government departments (GP, Ground water department)

14. Books and records maintained (rainfall data, ground water levels, etc) (yes / no)

15. Extension and education process

16. Perception about constraints (managing Assets, conflicts among the farmers, crop choices and water sharing)

17. Perception about suggestions in the project

IX. CPR DEVELOPMENT

1. General Information

1.1 Name of the Village	1.2 Mandal	1.3 District

2. Background Information about pilot

Type of common land	
Process followed to obtain lease/right	
Type of rights	
Tenure	

3. Date of establishment of the CIG: _____

4. Total members in the group? _____

5. Give the following details relating to the group members

Name of the Person	Caste	Education	Dependency on CPR	Primary occupation*

Caste: 1- SC 2- ST 3-Backward caste 4-Forward caste 5-Minorities (Muslim, Christian, etc.)
 * Accounting for major proportion of the time in a year.

5.1 Have there been changes in the group membership?

5.2 If responses are yes from a to c, give reasons?

Group has terminated membership	Left due differences with members	Monthly payment of wages	Need to concentrate in family activities	Not see any utility

6. CIG functioning

1	How often is the CIG required to meet in a year (mention the number)?	
2	How often did the CIG meet in the last calendar year?	
3	What is the percentage of attendance at the CIG meetings (Verify the records)?	
4	If less than 25 % members attend the meetings, collect details on the reasons and the effect that this has on the group?	
5	Please give details on membership fee contributed by members.	Amount
		Periodicity of contribution

6	Does CIG mobilising savings from members	1) Yes 2) No
---	--	-----------------

7. Participation in events related to CPR

S. No	Process	Aware 1-yes 2- no	Participated 1.yes 2. No	If no, reasons
1	Identification of CPR			
2	Selection of POP as users for CPR			
2.	Formation of CIG			
3	Agreement between GP and VO			
4	Social regulation (grazing and penalties) in grama sabha			
5	Revive agreement by GP			
6	Preparation of INRM plans			
7	EGS linkages			
8	Project support			

8. Activities taken up during the period

Activity	Quantum of work	Who were engaged	Person days of work	Source of funding
Plantation				
Saucing for plants				
Watering plants				
Grass seed dribbling				
CCT				
Compost pits				
Stone bunding				
Fire protection				
Watch and ward				
Nursery				
Bore well				

9. Immediate benefits

No. of plants survived	No of wage days created	Collection of usufructs (in Kgs)			Social norms Established (yes/No)
		Fuel wood	Fodder	Others	

10. Trainings and technical support provided to CIG members

11. Constraints and problems faced by Users

12. Any suggestions for improving the activity

X. LAND LEASE FARMING

1. General information:

Village	Mandal	District

2. Background Information about pilot

1	Total land leased-in	
2	Land belongs to	
3	Leasing period (agreement between VO and farmer)	
4	Date of establishment of the CIG	
5	Total members in the group?	

3. Entrepreneur arrangement with VO

(Code: 1- VO pays wages for care taker 2-Enterprenuer takes loan 3- profit is shared equally between VO and entrepreneur 4- Any other (specify)

--

4. Give the following details relating to CIG members

Name of the Person	Caste	Education	Single women (yes/NO)	Primary occupation*

Caste: 1-SC ; 2- ST-; 3-Backward caste; 4-Forward caste-; 5-Minorities (Muslim, Christian, etc.)
* Accounting for major proportion of the time in a year.

5. Have there been changes in the group membership?

5.1 If responses are yes from 1 to 3, give reasons?

6	How often is the CIG required to meet in a year (mention the number)?					
7	How often did the CIG meet in the last calendar year?					
8	What is the percentage of attendance at the CIG meetings (Verify the records)?					
9	If less than 25 % members attend the meetings, collect details on the reasons and the effect that this has on the group?					
10	Please give details on membership fee contributed by members.	<table border="1"> <tr> <th>Amount</th> <th>Periodicity of contribution</th> </tr> <tr> <td></td> <td></td> </tr> </table>	Amount	Periodicity of contribution		
Amount	Periodicity of contribution					
11	Does CIG mobilise savings from members	1) Yes 2) No				

12. Activities taken up in leased land

Activity	Number of Women	Area (in acres)	Investment					Wage days generated	Crop Yield
			Own	Financial institutions	VO	government Linkages	NREGA Support		
1. Nursery									
2. Crops diversification									
3. Fodder development									
4. Livestock related activities		-							
5. Vegetable cultivation									
6. other activities									

13. Role of VO in facilitation of the activity

Organized CIG	Training to CIG members	Run activity by paying wages	Credit and investment support	Technical support	Implements

14. Crop Economics (collect information for one main crop)

Major crops grown	Area (in acres)

14.1 Cost of cultivation

Human Labour

Activity	Men				Women			
	Person Days	Own	Hired	Rate / day	Person Days	Own	Hired	Rate / day
	1	2	3	4	5	6	7	8
Land preparation								
Sowing								
Weeding								
Top dressing								
Irrigation								
Fertilizers Application								
Insecticide/NPM								
Harvesting								
Threshing, Cleaning & Storage								

Bullock labour and Material cost

	Bullock Labour					Tractor	Material			
	Person days	Own	Hired	Rate / day	Days	Rate/day	Details	Quantity	Own	Rate
	9	10	11	12	13	14	15	16	17	18
Land preparation										
Sowing										
Weeding										
Top dressing										
Irrigation										
Fertilizers										
Insecticide/NPM										
Harvesting										
Threshing, Cleaning & Storage										

14.2 Revenue (Units: quantity in quintals and price in rupees)

Name of crop	Main Product				By product 1		By product 2	
	Total Quantity	Quantity not sold	Quantity sold	Price	Quantity	Price	Quantity	Price

15. Where did you sell produce?

16. Immediate benefits observed by CIG members

Benefits	Response
1. Asset base improved	
2. Additional income	
3. Wage days generated	
4. Others	

17. Support needed by CIG from VO

18. Perception about problems and constraints faced in the project

19. Suggestions for improving the activity?

XI. COMMON INTEREST GROUP OF GOAT REARERS

1. General information

Name of Hamlet/ Village	Name of the Mandal	Name of the District	Name of the CIG

2. Background Information

1	Date of establishment of the CIG	
2	Total members in the group?	

3. Give the following details relating to the group members

Name of the Person	Caste (a)	Literacy (b)	Number of goats

(a) Caste: 1-SC 2- ST 3- Backward caste 4-Forward caste 5-Minorities (Muslim, Christian, etc.)
 (b)

4. Have there been changes in the group membership? (Code: 1-New members joined 2-Some members left 3-Both 4-None of the above)		
5. If some members have left, give reasons?		
6. How often is the CIG required to meet in a year (mention the number)?		
7. How often did the CIG meet in the last calendar year?		
8. What is the percentage of attendance at the CIG meetings (Verify the records)? (1- 100 %; 2- 51-75 per cent 3- 26-50 %; 4-Up to 25 %)		
9. If less than 25 % members attend the meetings, collect details on the reasons and the effect that this has on the group?		
10. Please give details on membership fee contributed by members.	Amount	Periodicity of contribution
11. Does CIG mobilising savings from members (1-Yes 2-No)		
12. Does the CIG belong to any network? (1-Yes 2-No)		
13. What benefits does the CIG gain from the network? (1-To a large extent 2- Partially 3- Not at all)		

14. Activities of CIG

S. No	Activity	Yes/No	Members Benefited
1	Fodder species under NREGA		
2	Seed broadcasting in CPR		

	Fodder tree in own land		
3	Seed broadcasting grazing areas in and around villages		
4	Horse gram (fodder) in leased-in area by CIG		
5	Primary medical kit to CIG (payment and replenishment of kit)		
6	Kid rearing centre		
7	Scheduled vaccination		
8	Tied-up with para-workers		

15. How did the group help members in accessing services?

Services	Extent to which the help was rendered (a)	Support from Institutions (b)	Narration
Health care			
Vaccination			
Management			
Knowledge transfer			
Supplementary feeding			
Insurance			
Collective Marketing			
(a) 1-To a large extent 2-Partially 3-Not at all (b) 1-MMS 2-VO 3-SHG 4.VA 5-VAS 6.MRP 7-CIG 8-Network of CIG			

16. Whether CIG members received any training courses from the project (1. Yes 2. No)

17 If yes give details

18. Immediate benefits observed by goat rearers

Benefit	Response (1 yes 2. No)
1. Weight of kids increased	
2. Time saved	
3. if saved time, did you invested in other livelihood activities	
4. Monetary gains	
5. Any other (specify)	

19. Visit by the following field functionaries

Livestock coordinator	Para-vet	Village Assistant
Code: Monthly once-1; fortnightly -2; weekly once-3; No visits-4		

20. Problems and constraints faced in the project

21. Suggestions for improving the project

XII. GOAT KIDS REARING CENTRE

1. Basic information about caretaker

1.1 Name of caretaker	1.2 Name of the head of family	1.3 Caste	1.4 Literacy of farmer	1.5 Month/ year of starting activity

Caste: 1.SC 2.ST 3. OBC 4. OC

Literacy: 1-illiterate, 2- semi-literate, 3- Primary, 4 - Upper-primary, 5- Secondary, 6-college

2. Total kids < 4 months in the village (no.)

3. Kids put in rearing centre

Name of member	kids kept in starting (Number)	Number of kids in the centre now			
		<1 month	1 – 2 months	3 – 4 months	Total

4. Availability of shed and equipments

Location of shed	Area of shed (in Square meters)	Availability of other facilities (1. yes 2. No)			
		Roofing with plastic paper	Mesh	Tubs	Mineral mixture

Location of shed: 1. Rented place 2. Provided by care taker 3. Provided by CIG 4. Provided by GP

5. Availability of feed and vaccination facilities

Availability of feed (1. yes 2. No)		Green leaves (a)	Vaccination (b)	Care taker time (hours per day)	Visit by Village Assistant (c)
Mineral mixture	Salt-cake				

(a) Green Leaves: 1-Provided by care taker 2-Owner of kid
 (b) Vaccination: 1. AH dept 2. Health activist 3. Vaccination by owner 4. not done
 (b) VA visit: 1-Every day 2-Once in a week 3-Once in 15 days 4-Once in moth 5-Vists occasionally

6. Capacity building and technical support received by caretaker (1. yes 2. No)

Management	Vaccination	Feed	Others

7. Give information on the following?

Whether any CIG member is not sending kids to centre (1. Yes 2. No)	If yes, give reasons *	Whether any CIG member has withdrawn kids from centre (1. Yes 2. No)	If yes, give reasons*

* 1- Not able to pay 2- lack of proper facilities 3-lack proper feeding 4- Attack of disease 5- kids were sold 6-Kids are <1 month old 7-any other (specify)

8. Economics of activity

Particulars	Amount
1. Expenses	
Salary of caretaker	
Cost of feed	
Fixed costs (calculate per year)	
2. Revenue (Cost paid by owners of kids)	
3. Net income (revenue – expenses (after excluding project support/subsidies)	

9. Perception about problems and constraints in the project

10. Suggestions for improving the project

XIII. FISHERMEN COOPERATIVES

1. General Information

1.1 Name of the Village	1.2 Mandal	1.3 District:

2. Basic information about fishermen community/cooperative

2.1 Total number fishermen households	2.2 Name of the cooperative	2.3 year of registration	2.4 Area covered by the society (No. of villages/tanks)	2.5 total members in the cooperative	2.6 caste composition in the society

3. Performance of cooperative

3.1 Annual auditing 0. No 1. Yes	3.2 Records and books maintained (a)	3.3 Frequency of EC meetings	3.4 Frequency of GB meetings	3.5 Formed small groups within cooperative
3.6 Formed women CIG	3.7 formed workers group	3.8 Assessment of fish stock(trial netting)	3.9 MOU with VO	3.10 Source of credit (b)
(b) 1-Banks /Cooperatives 2- Chit funds 3- SHG/MFI 4- Moneylenders 5- Contractor/employer 6- Others				
(a) 1. Share register, 2. Cash book , 3. Receipt book, 4. Any other, 5. all the above				

4. Benefits accessed by the society from government programs or schemes?

Infrastructure	Fish seed	Credit 1. Yes, 2. No	Technical support

5. Leasing Arrangements

5.1 Did the fishermen cooperative society take the tank on lease?	
5.2 Who has given them the leasing Right? (1-Gram Panchayat 2-Fisheries Department 3-Irrigation Department)	
5.3 Lease amount paid (in Rs.)	
5.4 Who takes up fishery activity in the tank (1-Fishermen society 2-selected members within in the society 3- contractor 4- VO 5-Member of VO 6-Any other specify)	
5.5 Arrangements for sharing benefits	

6. Total Yield and Income from Fish Production in the Tank

6.1 If activity was taken up by fishermen cooperative society

Fish Production	
Total Quantity Produced (kgs)	Quantity price
Total Quantity Sold <ul style="list-style-type: none"> • Local Markets • Outside Markets • Consumption 	
Total value of the production (in Rs.)	
Expenses/Investments	

Fish Production	
<ul style="list-style-type: none"> • Lease amount • Seed cost • Watch and ward • Medicines • Feed • Transport • Storage • Total wages paid • Other non recurring expenditure (collect life time of the material and calculate average investment for one year) <ul style="list-style-type: none"> ○ Nets ○ Other equipments 	
Net income	

6.2. If activity was taken up by contractors

Fish Production	
Total Quantity Produced (kgs)	
Total Quantity Sold <ul style="list-style-type: none"> • Contractor share • Community share <ul style="list-style-type: none"> ○ Locally marketed ○ Consumed 	
Total value of the production (in Rs.)	
Income <ul style="list-style-type: none"> • Amount paid by the contractor to the community • Income from the community share (include value of fish consumed also) 	
Expenses/Investments <ul style="list-style-type: none"> • Lease amount 	
Net income	

7. Production related problems encountered by the cooperative

8. Whether cooperative is involved in marketing (yes/No)

9. If yes give details for 8.

APPENDIX 5: TRENDS IN RESOURCE USE

Mahaboobnagar As part of generic baseline, data were collected at the habitation level on the trends in use of resources which include cultivated land of large, small and marginal farmers, waste lands, bore wells etc. The trends were captured through specially conducted FGDs in each habitation for three time points viz., current level and levels at 20 years back and 10 years back in comparison to the current level. The cues used in this regard were ‘much more than the current level, more than the current level, same as current level, less than the current level and much less than the current level’. Instead of describing trends depicting changes in the levels in the two time points with reference to the current level, a quick procedure is followed where in an index reflecting the overall change in respect of each resource is attempted. For this purpose, the following weighting diagram is used:

Table A-1: Weighting diagram

20 years back	10 years back				
	Much more than the current level	More than the current level	Same as the current level	Less than the current level	Much less than the current level
Much more than the current level	0	-1	-2	-3	-4
More than the current level	1	0	-1	-2	-3
Same as the current level	2	1	0	-1	-2
Less than the current level	3	2	1	0	-1
Much less than the current level	4	3	2	1	0

The figures shown in the above table represent weighage. For example, if the position 20 yrs. back was ‘much more than the current level’ and it has shifted to ‘more than the current level 10 yrs. back’, the habitation will be assigned a weight of -1 indicating a decline in the value from 20 yrs. to 10 yrs. With reference to the current level, on the other hand, if a habitation records the position ‘much more than the current level 20 yrs. back’ and ‘much less than the current level’ (where the habitation assumes extreme levels in both the time points), then the habitation will be assigned a weight of -4, which represents a maximum possible decline from 20 yrs. back to 10 yrs back with reference to the current level. Similarly, on the other extreme, a habitation gets a weight of +4 points if it registers ‘much less than the current level 20 yrs. back’ and ‘much more than the current level 10 yrs back’. Here, the value +4 indicates that position has improved (on the 5-point scale). Thus, a habitation gets a value anywhere between the ranges of -4 to +4 depending upon the position reported. (It may be noted that an assumption made in the exercise is that the difference in numerical terms between any two successive cues is 1 point. Following this procedure, an index (RUI- Resource Use Index) reflecting the changes in the resource use is worked out for each resource. Once such an index is available, comparison across resources would be easier.

Cultivated land (large farmers-acres): Based on the information obtained, the following matrix is developed for 14 habitations.

		Cultivated Land – 10 years	Total
--	--	----------------------------	-------

		more than the current level	Less than current level	
Cultivated land - 20 years	Much more than the current level	8	0	8
	more than the current level	5	0	5
	much less than current level	0	1	1
Total		13	1	14

A quick glance at the tables shows that, in 8 habitations, the extent of acreage in the case of large farmers was much more than the current level 20 years back, but the position in this regard changed to 'more than the current level 10 yrs back', thus registering a decline by one point. Similarly, 5 habitations did not change their position in the perception of the members of FGD (in both the time points, the position reported was 'more than the current level'). In view of this reason these 5 habitations will get a value of '0' point each. But there is a lone habitation which gets one (positive) point by virtue of the fact that its position has improved from 'much less than the current level 20 yrs. back' to 'less than the current level 10 yrs. back). Using simple arithmetic, the total score obtained by all 14 habitations would be shown as $-7 (8 * -1 + 5 * 0 + 1 * 1)$ and it forms 12.5 per cent in the possible maximum of 56 points. The interpretation would be that for the 14 habitations as a whole, in the perception of the members of the focus group the decline from 20 yrs. back to 10 yrs. back in (the level of) the land possessed by large farmers with reference to the current year is to the extent of 12.5 percentage points. Similar computations are done for other resources also and the results are given in the following table.

Resource	Number of villages	minimum	maximum	Current average level	Resource Use Index (%)
Cultivated land-large farmers (acres)	14	12	650	226	-12.5
Cultivated land-small farmers (acres)	14	30	6500	862	+1.8
Waste land (acres)	14	0	320	39	-7.1
Forest land (acres)	14	0	976	183	-1.8
Community tank (number)	14	0	4	1.21	-3.6
Open wells (number)	14	0	100	19	-8.9
Bore wells (number)	14	5	300	118	+21.4
Groundwater level (feet from the ground)	14	50	175	119	-21.4

Note: Negative /positive sign in 'RUI' column shows decline/improvement from 20 yrs back to 10 yrs. back in the resource use with reference to the current level

As seen from the above table, the average extent of cultivated land for large farmers was 226 acres and the analysis by way of computing RUI suggests that this resource use has declined by 12.5 percentage points from 20 yrs. back to 10 yrs back. However in the case of cultivated land for small farmers, there is an improvement to an extent of 1.8 percentage points. It is further evident from the table that while forest land and community tanks registered decline of small magnitude (of 1.8 and 3.6 % respectively), waste land has undergone change with reference to the current level 39 acres by 7.1 percentage points. Decline of similar magnitude (8.9 %) is also noticed in the case of number of open wells (8.9 %). However, as expected, bore wells have registered improvement to the extent of 21 per cent with reference to the current level of 118 bore wells while ground water level has depleted by about 21 per cent on an average with reference to the current level of 119 feet depth. Thus, it can be concluded that all the parameters considered for analysis have shown declining pace during the last 20 yrs with reference to the current levels. But the extent of decline is well marked in the case of bore wells and ground water levels while it

is of moderate degree in respect of cultivated land (large farmers), waste land and open wells. Forest land and community tanks also registered a declining pace but the degree of decline is low. In all the cases, the decline is mostly attributed to population explosion.

APPENDIX 6: ADDITIONAL TABLES OF CHAPTER 3

Table B1: Distribution of sample farmers in the DFS pilot

Caste	Mahaboobnagar		Anantapur		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
Scheduled	18	44%	0	0%	18	26%
Scheduled	1	2%	5	19%	6	9%
Backward	18	44%	6	22%	24	35%
Other Cast	4	10%	16	59%	20	29%
Total	41	100%	27	100%	68	100%

Table B2: Education levels of sample farmers in the DFS pilot

Literacy levels	Mahaboobnagar		Anantapur		Total	
	Number of persons	Percentage	Number of persons	Percentage	Number of persons	Percentage
Illiterate	24	58%	2	7%	26	38%
Semi-literate	8	20%	5	19%	13	19%
Primary	1	2%	6	22%	7	10%
Upper-primary	2	5%	6	22%	8	12%
Secondary	2	5%	4	15%	6	9%
College	4	10%	4	15%	8	12%
Total	41	100%	27	100%	68	100%

Table B3: Extent of wet and dry-land owned by sample households

	Wet land		Dry land		Total land		% dry to total land
	Number of farmers	Irrigated land (acres)	Number of farmers	Area (acres)	Number of farmers	Total area (acres)	
MAHABOONAGAR							
SC	10	16	18	54	18	70	77%
ST	1	0.5	1	1.5	1	2	75%
BC	16	18.75	18	79.5	18	98.25	81%
OC	4	8.5	4	19.5	4	28	70%
Total	31	43.75	41	154.5	41	198.25	78%
ANANTAPUR							
ST	5	6.5	5	19	5	25.5	75%
BC	3	5.5	6	20	6	25.5	78%
OC	15	47.5	16	103	16	150.5	68%
Total	23	59.5	27	146	27	202.05	71%
OVERALL							
SC	10	16.0	18	54	18	70	77%
ST	6	7.0	6	20.5	6	27.5	74%
BC	19	24.25	24	99.5	24	123.75	80%

	Wet land		Dry land		Total land		% dry to total land
	Number of farmers	Irrigated land (acres)	Number of farmers	Area (acres)	Number of farmers	Total area (acres)	
OC	19	56.0	20	122.5	20	178.5	69%
Total	54	103.25	68	296.5	68	399.75	74%

Note: Figures in the parentheses indicate row-wise percentages of the total land owned

Table B4: Distribution of sample farmers according to land holding size

Farmer Type	Mahaboobnagar		Anantapur		Overall	
	Number of farmers	Percentage	Number of farmers	Percentage	Number of farmers	Percentage
Marginal (< 2.5 acres)	9	22%	2	7%	11	16%
Small (2.5-5 acres)	10	24%	3	11%	13	19%
Semi-medium (5 – 10 acres)	18	44%	12	45%	30	44%
Medium (10 – 25 acres)	4	10%	10	37%	14	21%
Total	41	100%	27	100%	68	100%

Table B5: Average extent of landholding by soil type

Soil type	Land Holding		Average Extent (acres)	Total extent	
	Number	Percentage		Extent (in acres)	Percentage
MAHABOONNAGAR					
Black soil	23	28%	1.76	40.5	23%
Red soil	30	36%	1.78	53.5	31%
Saline soil	3	4%	6.67	20	11%
Sandy soil	23	28%	4.74	56.3	32%
Alkaline	3	4%	1.67	5	3%
Total	82	100%	2.14	175.3	100%
ANANTAPUR					
Black soil	24	35%	1.5	35.25	24%
Red soil	32	46%	2.4	77.25	53%
Saline soil	8	12%	2.3	18	12%
Sandy soil	4	6%	3.5	14	10%
Alkaline	1	1%	0.5	0.5	1%
Total	69	100%	2.10	145	100%
OVERALL					
Black soil	47	31%	1.61	75.75	23%
Red soil	62	41%	2.11	130.75	41%
Saline soil	11	7%	3.45	38	12%
Sandy soil	27	18%	2.60	70.3	22%
Alkaline	4	3%	1.38	5.5	2%
Total	151	100%	2.12	320.3	100%

Table B6: Soil fertility of land operated by sample DFS farmers

Soil fertility	Number of plots	Average extent (in acres)	Total extent (in acres)	Percentage
ANANTAPUR				
Very poor	4	1.3	5	3%
Poor	8	1.4	11.5	8%
Average	48	2.2	105.5	73%
Good	9	2.6	23	16%
Total	69	2.10	145	100%
MAHABOBNAGAR				
Very poor	0	0	0	0%
Poor	9	3.0	27	15%
Average	73	2.0	148.3	85%
Good	0	0	0	0%
Total	82	2.14	175.3	100%

Table B7: Irrigated area by source of irrigation

Source	Number of plots	Average irrigable area (in acres)	Total extent (in acres)	Percentage
MAHABOBNAGAR				
Open well	3	2.0	6	8%
Bore well	21	2.59	54.5	76%
Tank	10	1.15	11.5	16%
Total	34	2.12	72	100%
ANANTAPUR				
Open well	8	1.6	13	25%
Bore well	25	1.36	34	67%
Tank	1	2.0	2	4%
Stream/spring	1	2.0	2	4%
Total	35	1.46	51	100%
OVERALL				
Open well	11	1.73	19	15%
Bore well	46	1.92	88.5	72%
Tank	11	1.23	13.5	11%
Stream/spring	1	2.0	2	2%
Total	69	1.78	123	100%

Table B8: Intercrops used as green manure by farmers

Practice	Total number of farmers		
	Mahaboobnagar	Anantapur	Overall
Crops grown	Black gram, cow pea, green gram, jowar, red gram and horse gram	Green gram castor, horse gram, cow pea, jowar, red gram	
Ploughing back	3	0	3
Spreading over surface	3	1	4

Table B9: Average extent of landholding vs. trees, fodder and SMC measures

Method	Number of plots	Average irrigated Area (acres)	Total area (acres)	Percentage to total district area
MAHABOBNAGAR				
Bund plantations	60	2.7	136	69%

SMC measures adopted	9	1.5	13	7%
Total area in district			198	100%
ANANTAPUR				
Bund plantations	49	1.86	93	46%
SMC measures adopted	37	1.95	72	36%
Total			203	100%
OVERALL				
Bund plantations	109		146	36%
SMC measures adopted	46		86	21%

* Percentages are calculated taking into total area i.e., 198.25 acres in Mahaboobnagar and 202.05 acres in Anantapur.

The percentages in the last column are not correct for the Overall total – because the figure of 146 for bund plantations is wrong: it should be 229, giving a % of 57% and not 36%.

Also, why is the average irrigated area being given?? What is it an average out of?

Table B10: Ratio of usage of chemical and non-chemicals

% of agri-chemicals used	Mahaboobnagar		Anantapur		Overall	
	Number of farmers	Percentage	Number of farmers	Percentage	Number of farmers	Percentage
100%	34	83%	12	45%	46	67%
75%	7	17%	3	11%	10	15%
50%	0		0		0	
25%	0		0		0	
0% chemicals	0		10	37%	10	15%
0% + 100% non-chemicals	0		2	7%	2	3%
Total	41	100%	27	100%	68	100%

Table B11: Livestock possession among sample farmers

Category	Mahaboobnagar		Anantapur		Overall	
	Number of households	% of total households	Number of households	% of total households	Number of households	% of total households
Bullocks	30	73%	21	78%	51	75%
Cows	18	44%	21	78%	39	57%
Buffaloes	10	24%	7	26%	17	25%
Goats	5	12%	4	15%	9	13%
Sheep	2	5%	3	11%	5	7%
Poultry	18	44%	21	78%	39	57%

Table B12: Draught power used for ploughing fields by sample farmers

Particulars	Mahaboobnagar		Anantapur		Overall	
	Number	% to total	Number	% to total	Number	% to total
Own bullock	30	73%	20	74%	50	74%
Hired bullock	9	22%	4	15%	13	19%

Tractor	2	5%	3	11%	5	7%
Total	41	100%	27	100%	68	100%

APPENDIX 7: ADDITIONAL TABLES OF CHAPTER 4

Table C-1: Distribution of the sample members by caste

Pilot/caste	ST	SC	BC	OC	Total
Mahaboobnagar					
Animal health services	0 (0)	13 (31)	21 (50)	8 (19)	42 (100)
Fodder Bank	0 (0)	10 (50)	6 (30)	4 (20)	20 (100)
Backyard poultry	0 (0)	16 (38)	21 (50)	5 (12)	42 (100)
Sheep Breed improvement	0	0	7 (100)	0	7 (100)
Anantapur					
Animal health services	6 (23)	5 (19)	14 (54)	1 (4)	26 (100)
Overall	6 (4)	44 (32)	69 (51)	18 (13)	137 (100)

* Note: figures in parenthesis indicate percentages

C-2: Distribution of the sample members by literacy levels

Pilot/literacy	Illiterate	Semi-literate	Primary	Upper-primary	Secondary	College	Total
Animal health services	27 (64)	6 (13)	4 (10)	2 (5)	2 (5)	1 (3)	42 (100)
Fodder Bank	11 (55)	2 (10)	5 (25)	0 (0)	2 (10)	0 (0)	20 (100)
Backyard poultry	25 (60)	7 (17)	5 (12)	3 (7)	1 (2)	1 (2)	42 (100)
Sheep breed improvement	6 (86)	1 (14)	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)
Anantapur							
Animal health services	7 (27)	1 (4)	1 (4)	4 (15)	8 (31)	5 (19)	26 (100)
Overall	76 (56)	17 (12)	15 (11)	9 (7)	13 (9)	7 (5)	137 (100)

* Note: figures in parenthesis indicate percentages

C-3: Timeliness of service delivery

Response	Mahaboobnagar		Anantapur		Overall	
	Number	Percentage	Number	Percentage	Number	Percentage
No vaccination	14	33	9	35	23	34
Non-adherence to time	4	10	11	42	15	22
Always provided at appropriate time	24	57	6	23	30	44
Total	42	100.0	26	100.00	68	100.0

Table C-4: Number of households possessing livestock and type of livestock across the villages

Village	Number of livestock	Livestock				
		Goats	Sheep	Cows	Bulls	Buffalos
		HH & total	HH & total	HH & total	HH & total	HH & total
Gokafaslabad	100	1 (5)	1 (60)	3 (9)	4 (12)	3 (14)
Doultabad	36	1 (2)	0 (0)	5 (20)	5 (14)	0 (0)
Lodhipur	34	2 (12)	0 (0)	2 (12)	5 (10)	0 (0)
Kottur	49	3 (21)	0 (0)	2 (12)	5 (10)	2 (6)
Total	219	7 (40)	1 (60)	12 (53)	19 (46)	5 (20)

Note: Figures in parenthesis represent total livestock population in the village

Table C-5: Details of members experience fodder shortage by quantum of fodder purchased

Name of the village	Purchasing details		
	Number of farmers	Quantity (Quintals)	Corresponding Cost (Rs.)
Gokafaslabad	5	15.5	3875
Doultabad	2	6.0	1500
Lodhipur	2	10.1	2525
Kottur	2	16.0	4000
Total	11	47.6	11900

Table C-6: Number of households received support and maintaining linkages with govt. across villages

Village	SHG/VO	Government		
		Fodder seed	Tree plantation	Drought relief
Gokafaslabad	--	1	--	--
Doultabad	1	--	--	1
Lodhipur	1	--	--	1
Kottur	--	--	--	2

Total	2	1		4
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Table C-7: Village wise number of households resorted to distress sale

Village	Number of households	Number of animals
Gokafaslabad	4	16
Doultabad	3	6
Lodhipur	2	5
Kottur	2	13
Total	11	40

Table C-8: Income from sale of eggs

Type of birds	Number of households	Number of eggs laid	Range	Eggs sold	Sold price per egg	Total Amount
Vanaraja	3	64	10-30	20	1.50	50
Local	17	661	10-150	120	1.50	180
Total	20	725	10-150	140	1.50	230

Table C-9: Income from sale of birds

Type of birds	Number of households	Average number of birds sold	Range	Rate per bird (in Rs.)	Amount (in Rs.)
Vanaraja	1	3	3-3	170.00	510
Local	9	45	1-10	74.22	3340
Total	10	48	1-10		3850

APPENDIX 8: ADDITIONAL TABLES OF CHAPTER 6

Table D-1: Distribution of the sample members by social groups

Pilot/caste	ST	SC	BC	OC	Total
Mahaboobnagar					
Land lease farming	0	11	12	2	25
Goat CIG	1	18	32	2	53
Fishermen cooperatives*	0	0	98	0	98
Anantapur					
Goat CIG	6	0	4	0	10
Fishermen cooperatives*	4	0	12	9	25
Overall	11	29	158	13	211

* Figures in the case of fishermen cooperatives indicates total members, whereas for other pilots the sample.

Table D-2: Salient characteristics of the members

Total members	25
Averages	
Age of members	39.2
% of members	
Literate members	16
Members having >30 years	32
Members having >40 years	36
Single women	72
Sole earning members	28

Table D-3: Size of land owned by members

Land (in acres)	Number	Percentage
0 (landless)	7	28
< 1 acre	7	28
1.1-2.0 acres	7	28
2.1-3.0 acres	3	12
>3.1 acres	1	4
Total	25	100

Table D-4: Livelihood activities by members

Primary Occupation	Number of members	Percentage	Other livelihood activities by members
Agriculture	6	24	One member each is also engaged in sheep rearing, nursery and ration shop.
Agriculture labour	17	68	One member each is managing petty shop and working as health attendant.
Service (Anganwadi)	1	4	Also engages in diary activity
Basket weaving	1	4	Also works as agriculture labour
Total	25	100	

Table D-5: Management practices by cooperative societies

Cooperative	EC meetings	GB meetings	Books & records	Small groups within society	Source of credit	Annual auditing
Gokafasalabad	Quarterly	Annually	Yes	Do not exist	Contractor	Yes
Lodhipur	Quarterly	Annually	Yes	Do not exist	Contractor	Yes

Table D-6: Benefits accessed by the societies from government

Particulars	Gokafasalabad	Lodhipur
Infrastructure	No	No
Fish seed	Yes (Subsidy)	No
Credit	No	No
Technical support	Yes (Fishery dept.)	Yes (Fishery dept.)