myrada

Evaluation of Watershed Programmes and LEISA

March 2010

NOVIB Core Grant Programme

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The Myrada Experience

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I. Introduction

MYRADA has been involved in Watershed Management in Karnataka, Andhra Pradesh and Tamilnadu in some of the driest and drought prone areas of the Deccan Plateau. Myrada took up watershed management programs in the early 1980s when it realized that: a) productivity was declining in drylands; b) the poor who had lands were largely engaged in dryland farming on the middle and upper reaches. Therefore investment in these dryland areas was required. However Myrada also realized that given the diversity of soils and land ownership and the presence of large farmers as well as landless in the watersheds, a sustainable strategy had to be inclusive - it had to involve all sections of the community. Therefore Myrada endeavoured to organize various types of peoples' institutions to promote: a) equity (these became the self help affinity groups), and b) sustainability of investments in micro watersheds1[1]

The first Watershed Management project where this strategy emerged was launched in Myrada in 1986. The Government of Karnataka (RD) and Myrada were partners; the project was supported by Swiss Development Cooperation. It was called Participative Integrated Development of Watersheds (PIDOW) and was based in Gulbarga District. Experience from this project helped in introducing watershed programmes in all other project areas of Myrada. Cumulative experience from all these projects helped in influencing Government programs especially those funded by the Ministry of Rural Development.

In the latter part of 90s, Myrada was involved in implementing large watersheds of KAWAD (Karnataka Watershed Development Society) in Chitradurga and Bellary districts of Karnataka. From 2001, Myrada played a major role in SUJALA, a large Watershed Project of the Government of Karnataka supported by the World Bank, implemented in 5 districts of Karnataka. Myrada's role in this project was at three different levels: (1) as Field NGO – facilitating communities to implement the program in six Sub-watersheds; (2) as Lead NGO in two Districts - providing capacity building, mentoring and facilitation services to 36 NGOs to implement Sujala Watersheds in 30 Sub-watersheds, (3) as Partner NGO at State level – involved in design of the program and in an advisory role to the Watershed Department. Apart from this, Myrada is involved in implementing NABARD supported watershed programmes in most of its project areas as well as watershed programmes

1 These became the watershed management groups, later the area groups and the user groups.

supported by private donors such as EZE, German Agro Action and NOVIB. This major growth in watershed management programs was also fuelled by the realization that a large number of loans taken by SAG members were for investment in dryland agriculture – a high risk activity. Watershed programs helped to reduce this risk by "making the water walk" and "bringing the soil back to life" – two slogans which caught peoples' attention.

Myrada's watershed development programme was the precursor to its LEISA (Low External Inputs Sustainable Agriculture) approach. Myrada did not consciously pursue LEISA as an agricultural intervention strategy until the 1990s. One of the reasons for this was that the work of Myrada was largely connected with small and marginal dryland farmers who could not afford to apply expensive external inputs in any case; they were, by default, low external input using farmers. However, it is also a fact that when issues of productivity enhancement came up, the emphasis tended to be on better seed varieties and increased chemical fertilizer application. The richer farmers were the first to use chemical inputs; following their example, the poorer farmers also began using these inputs often borrowing heavily to do so. This led to a gradual impoverishment, both of the farmers and the soil.

In 1991, Myrada and the IIRR-Philippines took up a small collaborative project of agriculture development on Kamasamudram Project, supported with a grant from the Ford Foundation. As a part of technical support, IIRR came up with a 'basket of technology options' approach to give farmers who had already adopted watershed management practices choices of various technologies to bring soil back to life. The two that became popular with staff and farmers were: (i) Planting trees on bunds to yield leaf matter for composting or direct field application. Non browsable, drought tolerant, nitrogen fixing species were planted (mainly cassia siamea). They were pruned after reaching a height of 6ft or so and the leaves were left on the field or put in pits to be used as manure and the branches were used as firewood. Over the years many families reported that they no longer had to purchase firewood and their purchase of chemical fertilisers also decreased to some extent. The activity also spread to other Myrada projects; (ii) Vermicomposting: this was also a successful intervention that started to spread rapidly.

Around the same time, the Myrada Krishi Vigyan Kendra started functioning in Erode District. By 2000 this KVK started to promote LEISA and natural farming. This was partly due to the influence of agencies such as Novib, Agriculture Man Ecology (providing technical support for agriculture extension) and IIRR (based on experience from Kolar and later, as a partner in KVK programming), and partly due to the pre-disposition of the newly recruited KVK technical staff themselves. Today, the KVK has become a major facilitator of LEISA in the district, and is acknowledged by the Indian Council of Agricultural Research as one of the few KVKs pioneering LEISA. Starting with LEISA, Myrada has gradually shifted to promoting completely organic farming on certain projects.

LEISA activities in Myrada were undertaken in the context of watershed development programmes. Soil and moisture conservation, which watershed management focuses on, is only the first step in watershed development and management. The next step is to increase the productivity in a sustainable way by ensuring soil health, "Bring the soil back to life". As a result the first farmers to adopt these methods were those who had already been trained through the watershed programmes in measures such as integrated pest management, etc. Farmers who had participated in Farmers' Field Schools and other exposure programmes through the watershed development activities were beginning to get convinced of the benefits of returning to the organic way of farming. The rising costs of fertilisers and pesticides and their in-time unavailability have also caused many farmers to turn to organic farming or at least reduce the use of chemical inputs. In keeping with Myrada's mission of promoting local level institutions, it has attempted to promote such institutions that will take on the ownership of LEISA and organic farming activities and ensure that these activities not only take root but are sustained.

II. Summary

This study is divided in two parts. Part I covers covers the watershed programme. Part II covers LEISA (Low External Inputs Sustainable Agriculture).

Myrada's main thrust of both its watershed development programme and the LEISA promotion activities is to increase, in a sustainable way, the livelihoods base for the small and marginal farmers who eke out a living from small landholdings, using limited resources and are largely dependant on erratic rainfall.

Myrada has been implementing watershed development programmes on its projects for nearly twenty five years. In order to assess the impact of these programmes, two project areas, in Kolar and Chitradurga districts in Karnataka were chosen for study. Following attempts to regain soil fertility through soil and moisture conservation, efforts were made to bring back the soil to good health by decreasing external inorganic inputs and increasing organic inputs. In H.D. Kote Taluk of Mysore district in Karnataka and in Erode district in Tamil Nadu, this has been Myrada's focus. Hence these two project areas were also chosen to assess the impact of this particular activity.

Impact on Livelihoods: In agrarian communities it is not easy to compute incomes using standardised formulae. There are many dynamic variables and factors which are outside people's control. Hence certain proxy indicators were selected to assess impacts and changes. These proxy indicators are the following:

i. Reduced migration- This impact is clearly visible in the areas where watershed development activities have taken place as farmers begin to cultivate their land almost as soon as some treatment measures have been undertaken instead of leaving it uncultivated and working as labourers elsewhere. In Kolar and Chitradurga districts, there has been a clear reduction in the number of families going for seasonal migration; 8 out 9 villages visited by the evaluation team in Kolar and Chitradurga districts, reported reduction in the number of families migrating for work. There was 100% reduction in D.Kothindlu village and 90% reduction in Venkatapura village in Kolar district; it is to be noted that these are among the older watersheds, i.e. it has been ten years or more since completion of implementation. One village reported a reduction in the number of days that families migrate for work.

ii. Increase in production and productivity - Watershed activities have brought more lands under cultivation through removal of boulders, levelling, etc. There has also been an increase in number of bore well sunk and a shift from food crops to commercial crops which could be a cause for concern in the context of food security for marginal farmers who are affected by the rising prices of basic foods. All farmers in all the villages reported increased soil and moisture retention post-watershed activities. One farmer in Kolar district (Doddadanavalli village) reported an increase of 6 inches of soil on his farm. Almost all villages reported an increase in productivity. The reported increase in Ragi yields varies from 2 to 3 quintals per acre. A few farmers also attribute this to adoption of hybrid varieties. There has been an increase in cultivation of vegetables in almost all villages due to the increased availability of water. Almost all villages have changed partly from cultivation of food crops to growing commercial crops post-watershed treatment. In RG Camp village in Chitradurga, even small and marginal farmers have begun to cultivate plantation crops such as arecanut and banana. In this village the area under ragi has come down considerably. This is also evident in Erode and Mysore districts where many farmers are now beginning to cultivate commercial cops such as sugarcane, banana and turmeric.

Many farmers reported an increase in food security because of increased productivity of food crops such as ragi and vegetables. In D.Kothindlu for instance, farmers said they are now able to grow enough food to stock for a year apart from selling the surplus.

In Mysore and Erode districts where farmers have been practising organic farming, the actual productivity in terms of number of quintals per acre has reduced in some cases, but this has been offset by the almost negligible cost of inputs and increased price for products through grading, cleaning and tie-ups with buyers who purchase directly from farmers. For instance out of 15 cotton farmers in HD Kote taluka, 7 reported an actual decline in per acre yield of cotton. However all 15 reported an increase in income per acre due to: a) increased price for cotton because of grading and cleaning and direct purchase by buyer at correct weights; (b) zero use of costly chemical inputs; (c) sharp reduction in borrowing from money lenders – at interest rates varying from 50 to 120% per annum – for purchase of inputs; they now borrow from SAGs or Watershed groups. Similarly banana growers in Erode district reported a decrease in yield but this was compensated by higher price fetched for better colour and bunch weight. All farmers unanimously vouched for better taste and quality of organically grown grains and vegetables.

iii. Increase in availability of water – 3 out of 5 villages (where watershed activities were implemented) reported increase in water availability post watershed treatment. Some villages reported good surface water availability after watershed activities. In all the villages there has been a definite increase in the number of bore wells, but it is difficult to pin point any single reason for the sudden increase. But the watershed programme is definitely one of the contributing factors. Besides other reasons, people have gone in for bore wells,

either because of increased ground water, or because, after watershed activities, the land held better promise of improved productivity. Apart from an increased number of bore wells, some defunct bore wells have also started yielding water and existing bore wells have enhanced yields.

With increased water availability, either in the form of surface water or due to increased number of bore wells or increased yield of bore wells, many of the farmers have increased the area under irrigation. According to secondary data available, in Hirehalla sub-watershed, there has been an increase of around 10 to 35 Ha. of irrigated land in each micro-watershed, and in the case of Gangasamudra sub-watershed, the increase is between 15 to 33 Ha. in each micro-watershed.

iv. Improved asset base (assets such as TV, vehicles): Farmers in all four districts reported positive changes in living conditions. Membership in SAGs and watershed development associations has given them access to credit, information and skills training. Many have built/ repaired houses, repaid old high cost loans, bought assets such as television sets, vehicles and invested in businesses such as tailoring, petty shops, etc.

The number of livestock, especially cattle, has declined in several villages. Out of the 9 villages covered in this study in Kolar and Chitradurga, 4 villages reported gradual decline in cattle population over the past 5 to 10 years, whereas the remaining 5 reported an increase. A majority of the 34 farmers interviewed in Mysore and Erode also have fewer heads of cattle now than before. Reasons quoted for decline in cattle population mostly related to maintenance problems – especially in cases where each household owned more than 10 to 15 cattle. And yet, improved vegetation as part of watershed activities in the older project areas has also resulted in farmers being self-sufficient in fodder. Farmers in these areas have a smaller number of cattle but usually of higher quality.

v. Increased Vegetation - An increase in vegetation has been the most visible impact of the watershed projects. Several thousands of trees including species such as Cassia siamea, Pongamia, Neem, Silver Oak, Acacia have been planted on bunds, road sides, school campuses and common lands. The most common among them is Cassia siamea which grows very fast and has contributed greatly to the green cover in the watershed areas. Besides, it also provides green manure and firewood to the farmers of the area.

MP Doddi village in Erode district has shown a clear trend in reduction of consumption of firewood. This is not only due to increased bio-mass plantation but also due to increased use of bio-gas promoted by the CMRCs[2].

2 Community Managed Resource Centres (CMRCs) are membership based organizations of SAGs which provide services to member CBOs. They emerged as structures that would continue to provide services in areas after Myrada's withdrawal, the CMRCs are today registered bodies functioning with varying degree of independence. They provide services from book keeping to livelihood provision, health, bank linkages and legal counseling to member CBOs and others. They have staff support from Myrada.

vi. Improved soil health – This impact is most visible in Mysore and Erode districts where LEISA and organic farming are being practised. All 34 farmers in the survey reported a visible change in the texture of the soil. From being hard and discoloured, the soil is now loose, slightly moist and looks almost like compost. Many farmers reported that it is now easier to plough. All farmers produce their own bio-growth promoters called jeevamrutha, panchagavya and also bio-pesticides. All of them have also reported increased use of farm yard manure and vermicompost. Eco-sanitation (which converts human waste into manure) is popular with farmers in Mysore and Erode districts. Also widely implemented in the Erode district is the upgraded cowshed with hygienic urine collection pit. All these are part of the basket of practices under the Integrated Farm Development program; all have contributed greatly to increasing soil health.

vii. Reduction in indebtedness – A majority of the 24 farmers in HD Kote – mostly cotton growers – reported great relief at being debt-free; they no longer need to borrow heavily from money lenders to buy fertilisers and pesticides for their crops as they produce all these themselves. The farmers in HD Kote reported improved health as they no longer sprayed pesticides. In addition, many farmers in HD Kote reported using their own labour or a mutual exchange of labour (the traditional practice of muyyalu) thereby incurring lower costs. However for farmers in Erode, unavailability of labour posed a major constraint. Most farmers in Erode also reported a reduction in cost of cultivation as they have also reduced the use of inorganic external inputs.

viii. Role of Institutions: In Kolar and Chitradurga districts, the Area Groups and Watershed groups, where they are still active, continue to maintain the watershed structures. In 2 out of the 9 villages, the area groups are active – they continue to function like any other Self Help Affinity Group and in D.Kothindlu and Venkatapura village they have been linked to the Community Managed Resource Centres (CMRCs) being promoted by Myrada.

In Erode district too, the CMRCs play an active role in providing services to farmers. Farmers in Mysore district are affiliated to two institutions – the Savayava Krushi Sangha (SKS – which is a Registered Society) and the Kabini Organics Producers' Company (which is registered as a Producers Company of cotton growers). With support from MYKAPS[3], the institutions currently provide support to farmers in market linkages, certification and training. Cotton farmers in Mysore district have been trained in cleaning and grading and fetch a premium price for their organic products from Appachi Cotton which purchases their produce. Similarly tie-ups with certain buyers have helped the organic vegetable growers obtain good prices. In Erode district the project has helped farmers in certification and a tie-up with a Coimabtore based company (Super Spinning Mills) for direct purchase of cotton from farmers.

3 MYKAPS (Myrada Kaveri Pradeshika Samaste) is a registered society hived off from Myrada in 2006. It is part of the Myrada group of Institutions (MGIs) which share a common mission/vision with its own priorities.

SKS and Kabini Organics in HD Kote are actively involved in lobbying with the government at district and state level for the promotion of organic farming practices and have been actively involved in campaigns against Bt. Cotton. These farmers expressed an ideological opposition to all forms of genetically modified crops.

Causes for concern – A major cause for concern in the watersheds is the increased number and dependence on bore wells. While this might be understandable, given the farmer's expectation of higher production and better yields with more water, it needs to be discussed at farmers' meetings and group meetings. There is the danger of over exploitation of ground water. Indiscriminate sinking of bore wells in the absence of legislation continues to be a problem and in order to prevent watershed programmes from aggravating this problem, it is necessary to include this component at the time of micro-planning, i.e. at the planning stage itself, plan the number of new bore well that can be sunk in a particular watershed. Once again, to encourage optimum use of water resources, it is advisable to include promotion of more efficient water management practices in watershed programmes. Examples would be promotion of SRI (System of Rice Intensification), a system of growing paddy that consumes less water and the cultivation of crops that consume less water.

Another issue for discussion with farmers' groups is that of food security. With increased water availability, farmers tend to move from food to commercial crops. This could be due to better prices for commercial crops as compared to prices for food (cereals). Two farmers in Erode district reported that they buy all their food grains as they grow only commercial crops (maize, turmeric). This could threaten the food security especially of the small and marginal farmers. While it is necessary for farmers to grow commercial crops in order to ensure their livelihoods, it is also important that they grow food crops – at least sufficient for their own consumption.

III. Objectives of the Study

Part I
Evaluation of the Watershed Programme

The objectives of the evaluation of the watershed programme in Kolar and Chitradurga projects are:

i. To assess the reach and coverage of watershed programmes in two of the project areas of Myrada in terms of extent of area covered (dry land and irrigated land), number of micro-watersheds covered, number of farmers benefited (marginal, small and others), number of trees planted, number of hectares covered under plantation and number of landless families who benefited from watershed activities.
ii. To assess the impact of the watershed programmes in terms of increased incomes, increased production, diversification of crops, increased asset base, increased soil health and water availability.
iii. To assess the role of people's institutions in Watershed Development and Management.

Note: Observations on the NABARD cluster development programme in Chitradurga which adopts the watershed framework but focuses on promoting the livelihood strategies of poor families have been included.

Part II
Evaluation of the LEISA Programme

The objectives of the LEISA programme in H.D. Kote and Erode are:

iv. To assess the impact of LEISA and organic farming activities on the lives and livelihoods of farmers, specifically to assess the number of practices adopted and what has been the contribution of these practices in enhancing soil health and increasing vegetation.
v. To assess to what extent LEISA and organic farming practices have spread among other farmers and contributions made to policy level changes
vi. To assess the role of people's institutions in promotion of LEISA and organic farming.

PART I

Evaluation of the Watershed Development Programme

PART I

Evaluation of the Watershed Development Programme

1.1 Methodology

For assessing the coverage and impact of watershed activities, two districts were selected, viz. 1) Chitradurga, and 2) Kolar. In Kolar, the EZE-sponsored watershed programme (that was implemented between 1986 to 2003 in four phases) and the Government of Karnataka/World Bank sponsored Sujala watershed programme (implemented between 2002 to 2007 in three phases) were assessed. In Chitradurga, only the Sujala watershed programme (implemented between 2002-2007) was assessed. In addition to the completed watershed programmes, an ongoing programme – The NABARD-sponsored Cluster Development Programme – was also studied to see how the learnings from earlier projects have influenced the design and implementation of a new project.

In order to assess the impact of watershed programme extensive field visits were carried out and discussions were held with individual farmers, with Area Groups (AG)/ Watershed Development Assocations (WDAs) and Executive Committees in each of the micro-watersheds visited[4]. Field visits were undertaken by the study team to the following watersheds:

4 The AGs/WDA, ECS are described on page 16/17.

Table 1: Watersheds covered by Evaluation team

District and Project	Sub-watershed and micro-watershed visited	Villages visited	Interacted with
Kolar: EZE watershed	Vrushabhavati watershed	D Kothindlu	WDA
Kolar: EZE watershed	Venkatapura watershed	Venkatapura	WDA
Kolar: EZE watershed	Toralakki watershed	Doddanahalli	Venugopal WDA
Kolar: Sujala watershed Programme	Palar River Left Bank sub-watershed : Madderi Mallandahalli Micro watershed	Mallandahalli	Madderi-Mallandahalli EC Ramapura Dinne AG
Kolar: Sujala watershed Programme	Palar River Right Bank sub-watershed : Aralakunte micro-watershed	Aralakunte	Prakruti EC
Kolar: Sujala watershed Programme	Mushtrahalla sub-watershed : Mithalli micro watershed	Badgutlahalli	Sri Rama AG
Chitradurga: Sujala watershed Programme	Hirehalla sub-watershed: Sri Rama Agrahara micro-watershed	Padigatta	Vedavati AG
Chitradurga: Sujala watershed Programme	Gangasamudra sub-watershed: Ranganathswami micro-watershed	R G Camp	Hunashikatte AG
Chitradurga: Sujala watershed Programme	Hirehalla sub-watershed: Gajanana micro-watershed	Malkapur	Vinayaka AG

Apart from the above, the team also met individual farmers and conducted case studies to capture the impact at the individual level. The team interacted with 6 small and marginal farmers, in each of the three project areas – EZE and Sujala in Kolar and Sujala in Chitradurga. While selecting the farmers, it was confirmed that the family also had membership in SAGs. This helped in assessing the impact on the family's livelihood, since livelihood activities were promoted in SAGs and watershed activities implemented through WDAs/ AGs.

A guiding questionnaire was used for all the above interactions, a format of which is enclosed in Annexure 1a.

1.2 Introduction to the Watershed Projects visited

Introduction to the EZE Project

Of the two districts covered by this study, the German Funding Agency – EZE, supported programmes in one district, i.e. Kolar. EZE's support in Kolar started in 1986, when Myrada started promoting SAGs. This was an important phase for Myrada as it was during this period that it started shifting from an individual approach to a Group (Community Based Organisation) approach in development. In 1990, Myrada (in Kolar) began to look at community based groups in Natural Resource Management with specific focus on Watershed development.

EZE supported the Myrada project in Kolar from 1986 to 2003 in four phases. Women's development through SAGs and Federations and Watershed development through Watershed Development Associations (WDAs) were the major components of the programme throughout this period.

The approach to Watershed development went through a great deal of evolution over the four phases of EZE. As the programme responded to the needs of the people and the technical requirements of the watershed, it constantly kept evolving from an individual approach to an institutional one. Some of these changes were:

- Planning and implementation of Watershed activities by Watershed Development Associations (WDAs)
- Institutional Capacity Building of WDAs through training in technical management and financial skills.
- Financial assistance was provided as grants for works on private and common lands provided contribution was forthcoming.
- Shift in project's approach from grants to loans for works on private land to achieve ownership and sustainability
- CBO decision to use machinery for implementation of soil and water conservation measures where labour was unavailable
- Institutional capacity building Watershed Development Associations in a similar way as SAGs.

Evolution of Watershed Programme over the four phases of EZE:

As the project evolved it incorporated the learning from the previous phase into the next phase. Thus, each phase was progressive in approach as compared to its previous phase. Phase I focused on individual farmers. Land development was undertaken on individual basis. Bio-mass production was a major focus of the

project. As Myrada's understanding of CBOs strengthened, it also adopted the same in Watershed projects. Thus Phase II and III saw more of institutions based watershed development activities. All watershed works were carried out by WDAs. During this phase, technical aspects of watershed treatment gained more clarity. Phase IV focused more on institutional strengthening – WDAs took more responsibility for watershed activities; funds for watershed development was directly transferred to groups; and from the sustainability point of view, the WDAs were groomed to function like SAGs. Thus, savings and credit became an important part of WDA activities – loans were taken for land development and agriculture related activities.

Another important change that happened in Phase IV was the shift from grants to loan in watersheds. For all private land activities farmers took loans from the WDA. Common land activities were grant based. Application of this concept presented two important outcomes: 1) more land got treated within the limited budget – as the allotted amount was rotated among farmers as loan, 4 times more land got treated (as against budgeted and planned); 2) a rigid ridge to valley concept and all required technical interventions could not be adopted as farmers took decisions, based, not on topography, but on their capacity to take loan and repay; however treatment of all lands emerged as a vision of WDAs.

EZE's trust in Myrada and support that spanned a continuous period of 17 years helped Myrada to establish itself as a leading NGO in the district, especially in the field of promotion of Community Based Institutions, Natural Resource Management, Watershed development and Insitutional Capacity Building.

In Chitradurga district, Myrada implemented a similar programme of watershed development that was funded by the German agency German Agro Action (GAA).

Myrada's expertise in these areas was sought by many Government and non-Government development agencies. Due to this rich experience Kolar and Chitradurga were designated as the Lead NGOs for Kolar and Chitradurga by the World Bank Assisted Sujala Watershed Programme.

Activities carried out in the Watershed Programme supported by EZE:

The following activities were taken up:

Earthern/ boulder bunding, nala revetments, gully plugs, gully

checks, vegetative checks, farm ponds, open wells, series of sunken ponds, percolation tanks, trenching, nala treatment, diversion drains, check dams, land leveling, land reclamation, silt application, roof and surface water harvesting, bund plantation, fodder promotion on bunds, block plantation, etc.

Apart from promotion of watershed activities, the EZE programme also focused on forming Community Based Institutions (both SAGs and WDAs) and building their capacities to manage and maintain their resources and programmes. The SAGs trained to manage their financial and organizational matters whereas the WDAs were trained and took responsibility for planning and implementing the watershed programme. Federations of these institutions were also formed.

Area covered under the EZE Programme:

A total of 78 micro-catchments (around 120 to 150 acres each) were covered as part of EZE project over its 4 phases. This covered 54 villages and a total of 10,559 acres of land. Out of this, 57% was private land, 7% was fallow land and 36% was common land. 88.7% of the private land was dry land. A total of 1960 farmers were covered, out of which 81% were small and marginal farmers.

Table 2: Area covered under EZE programme

Sr.No.	Particulars	Achievements
1.	No. of Micro Catchments	78
2.	No. of villages covered	54
3.	Total watershed area a) Cultivable land ➢ Dry land ➢ Irrigated land Total b) Uncultivable land c) Common land	4568 Ha. 2283Ha. 767 Ha. 3050 Ha. 449 Ha. 1069 Ha.
4.	Total watershed area treated a) Cultivable land ➢ Dry land ➢ Irrigated land Total b) Uncultivable land c) Common land	4224 Ha. 2122 Ha. 272 Ha. 2392 Ha. 291 Ha. 1540 Ha.
5.	No. of farmers covered ➢ Marginal ➢ Small ➢ Big	1960 939 644 377
6.	Total investment on watershed a) On private land b) On common land	62,44,691.70 45,95,377 16,49,314.70

(Source – Myrada Kamasamudram Project Report, 2003)

A total of Rs. 62.5 lakh was spent on watershed activities in the four phases of EZE programme. Out of this 74% was on private land and the rest 26% was on common land.

Table 3: Community Based Institutions promoted in EZE

	Community Based Institutions Promoted	Numbers
1.	WDAs	63
2.	Total members in WDA ➢ Land holders ➢ Landless	1192 1171 20
3.	No. of WDA federations	4
4.	No. of SAGs promoted	312
5.	No. of members	6082
6.	No. of SAG federations	14

Introduction to Sujala Watershed Project

Sujala, a World Bank assisted watershed project was implemented in five districts of Karnataka. Its aim was "….to increase the productive potential of the watersheds by involving the communities in the process through building appropriate people's institutions, and capacitating them to plan, implement and manage their own resources to achieve more sustainable development".

The project was implemented over a period of 5 ½ years, from September 2001 to March 2007, in three phases. The total project cost was of the order of Rs.600 crores. This was shared by the World Bank, the State Government and local communities in the ratio of 80%, 10% and 10% respectively.

The Project was implemented in 1270 villages of 38 taluks of five districts viz. Tumkur, Kolar, Chitradurga, Dharwad and Haveri. In all, 77 sub-watersheds (around 800 micro-watersheds) covering 4.27 lakh Hectares were treated. Each sub-watershed covers around 5000 to 7000 Ha. In rare cases it has also gone upto 10000 to 12000 Ha. Each micro-watershed covers an area of about 500 to 700 Ha. Each micro-watershed had several area groups.

Sujala was a multi-stakeholder project, with different kinds of partnership at all levels. The Watershed Department (Government of Karnataka) at both state and district level was incharge of overall project implementation. The NGOs were incharge of community mobilization and facilitating implementation through Community Based Organisations at the grass-root level. Apart from these, there were many other private and quasi-government organisations involved in the project.

Myrada's role in Sujala

Myrada's association with Sujala project started even before the project was operationalised. When the project was being formulated and the World Bank was having preliminary discussions with the State government, Myrada was invited to share its experience of working in watersheds involving the local community and thus guide the project in formulating the social mobilisation strategy. Myrada helped the project in determining the institutional framework for this community driven participatory watershed project.

Myrada's role in the project was at three levels – 1) as **Partner NGO** (PNGO) at the State level; 2) as **Lead NGO** (LNGO) at district level, in two districts namely Kolar and Chitradurga; 3) as **Field NGO** (FNGO) at sub-watershed level, in 6 sub-watersheds – 4 in Kolar and 2 in Chitradurga.

As PNGO, Myrada worked as an advisor to the Department of Watersheds, Government of Karnataka on various aspects related to project implementation. Besides this, it also

supported in setting up systems for monitoring the project and developing strategy for capacity building at all levels in the project.

As LNGO, Myrada was incharge of training, facilitating and supervising the FNGOs of Kolar and Chitradurga districts. As FNGO, Myrada was responsible for implementing the project at sub-watershed level (in 6 sub-watersheds) in partnership with Community Based Organisations.

Community Based Institutions in Sujala

Myrada helped in institutionalizing and integrating community participation in Sujala. The following community based institutions emerged in Sujala:

- **Area Groups (AG)**

Area Groups are groups of farmers, formed at the mini-micro-catchment (100 to 150 Ha.) level. All the farmers owning land within this catchment are members of this group. This is the smallest unit that manages watershed planning and implementation. The concept of area groups was promoted by Myrada based on its experience of working with smaller participatory group of farmers, which in other projects are called WDAs (Watershed Development Associations). Some of the AGs, where all landowners were small and marginal farmers, functioned like SAGs during the project period and undertook savings and credit activities together with watershed activities.

- **Self Help Groups (SAGs)**

These were promoted to ensure equity in a watershed project which by its very nature is land based. Members of SAGs were from landless and small/marginal farmer families. A revolving fund was given to these groups to assist the members to take up income generation activities and to support their livelihood strategies which consisted of several activities. The assistance to members in the group was in the form of loans. Apart from financial assistance, the project also provided entrepreneurship development and skill development training to SAG members.

- **Executive Committees (EC)**

  Executive Committees were representative bodies at the level of micro-watersheds (500 to 700 Ha.). There were around 14 to 18 members in the EC depending on the number of mini-micro-catchments under each micro-watershed. The members were selected from AGs and SAGs. These were registered under Societies Act, 1961. The ECs were responsible for getting the micro-plans prepared at individual farmer level through AGs. They were also responsible for overall implementation at the micro-watershed level. Funds for the watershed programme were given to ECs for onward transmission to the AGs.

The Implementation Process in Sujala

The Sujala watershed programme was designed to promote decentralized planning, monitoring and implementation. Hence micro plans for watershed activities, which were called SWAPs (Sujala Watershed Action Plans), were prepared at farmer level, by visiting every farmer's land. FNGO field staff were involved in preparation of SWAPs along with AG and EC members. The technical staff from the Department of Watershed at the district level were also involved in the process. SWAP not only included treatment measures for private land, but also included activities planned on common land and along nalas. The SWAP was later consolidated at the micro-watershed and sub-watershed levels. Budget for the entire SWAP was worked out, along with estimation for people's contribution as per project guidelines; contribution varied from 10% to 30%, depending on the nature of activity. The SWAPs were then sent to the Watershed Department for final approval.

ECs and AGs were the main implementing bodies; FNGOs played a facilitatory role, whereas ECs were responsible for implementation and monitoring. The budget for implementing the activities of SWAP was transferred on installment basis from the Watershed Department to the ECs as per project guidelines. Implementing work on private land was the responsibility of individual farmers. Work on common land and nalas was the responsibility of AGs and ECs. All payments were made through cheques at weekly EC meetings. There were well laid out procedures for disbursement of payment to AGs and individual farmers. Monitoring during implementation was the joint responsibility of FNGO staff, ECs and AGs. Department staff was responsible to check measurement after the completion of work and before making payments.

Activities undertaken in Sujala

Private land activities: Boulder bunds, earthern bunds, farm pond, diversion drains, waste weirs, bore and open well recharge, forestry and horticulture activities, etc.

Common land activities: Boulder check, diversion drain, dugout pond, recharge pits, gokatte (cattle pond), forestry and horticulture activities, etc.

Drainage line activities: Boulder checks, vegetative checks, nala revetment, rubble checks, sunken ponds, etc.

Other activities: Livestock and fodder promotion, kitchen garden, roof water harvesting, etc.

Addressing Equity through SAGs: SAGs were promoted with an intention to address equity issues. Select members (belonging to economically backward families) were given entrepreneurship and skill training to help them with alternate income generation options. Revolving fund was given to all SAGs for improving livelihood of members. This amount was advanced to members as a loan.

Area Covered under Sujala in Kolar District

Myrada was the Lead NGO in Kolar. A total of 1,21,196 Ha. was treated in 578 villages (22 sub-watersheds) in Kolar as part of Sujala Watershed Project. A total of 22 FNGOs were engaged in implementing the project spanning over three phases - from 2002 to 2008.

Out of this, Myrada implemented the project in 4 sub-watersheds as FNGO. This was in Palar River Left Bank, Palar River Right Bank, Markandahalla and Mustarhalla. The details of coverage in these 4 sub-watersheds are as follows:

Table 4: Coverage by Myrada FNGOs in Sujala, Kolar

Sub-watershed	Total area covered (in Ha.)					No. of farmers covered			Budget (in Rs.)		
	Private land		Common land	Fallow land	Total	S & M	Big	Total	Project	Contr	Total
	Dry Land	Irrigated land									
Palar River Left Bank	2664.18		1174.1		3838.3	2795	518	3313	2.42 cr.	57 lakh	3 cr.
Palar River Right Bank	2663	379	977		4019	1697	249	1946	2.65 cr.	39.2 lakh	3.04 cr.
Mustrah-alla	5552.15	1185.2	2371.5		9108.85	2744	84	2828	2.89 cr.	51 lakh	3.4 cr.
Markan-dahalla	3396	447	454.6	22	4319.6	2691	153	2844	2.68 cr.	23 lakh	2.9 cr.
Total	14275.3	2011.2	4977.2	22	21285.7	9927	1004	10931	10.64 cr.	1.7 cr.	12.34cr.

As FNGO, Myrada worked in 120 villages of Kolar. A total of 21,285 Ha. of land was treated in the 4 sub-watersheds covered by Myrada in Kolar district, of which 77.6% was private land and 23.3% was common land. A very small portion of it was fallow land. Of the private land works, 87.5% were carried out in dry lands and the remaining 12.5% was in the irrigated lands. 91% of the farmers covered were small and marginal farmers.

Community Based Institutions: A total of 221 AGs, 327 SAGs and 37 ECs, were formed by Myrada in the four sub-watersheds implemented by it.

A total of Rs. 12.34 crore was spent in the two watersheds, out of which people's contribution amounted to 14%.

Area Covered under Sujala in Chitradurga District

Myrada, as FNGO implemented two sub-watersheds in Chitradurga – Hirehalla and Gangasamudra. The details of coverage are as follows:

Table 5: Area covered by Myrada FNGOs in Sujala, Chitradurga

Sub-watershed	Total area covered (in Ha.)					No. of farmers covered			Budget (in Rs.)		
	Private land		Common land	Fallow land	Total	S & M[5]	Big	Total	Project	Contr	Total
	Dry Land	Irrigated land									
Gangasamudra	3440	1764	1654	5	6863	2425	686	3111	2.96 crore	48.86 lakh	3.44 crore
Hirehalla	6727	3051	3042	6	12826	5515	1092	6607	5.4 crore	1.04 crore	6.44 crore
Total	10161	4815	4696	11	19689	7940	1778	9718	8.36	1.53	9.89

As mentioned above, Myrada was the Lead NGO in Chitradurga district. A total of around 88,000 Ha. (14 sub-watersheds) was treated in Chitradurga as part of Sujala Watershed Project. A total of 14 FNGOs were engaged in implementing the project spanning over three phases - from 2002 to 2008.

As FNGO, Myrada worked in 78 villages of Chitradurga. A total of 19,689 Ha. of land was treated in the 2 sub-watersheds covered by Myrada in Chitradurga district, of which 76% was private land and 24% was common land. A very small portion of it was fallow land. Of

5 S&M: Small and Marginal farmers

the private land works, 68% were carried out in dry lands and the remaining 32% was in the irrigated lands. 82% of the farmers covered were small and marginal farmers.

Community Based Institutions: A total of 132 AGs, 194 SAGs and 23 ECs, were formed by Myrada in the two sub-watersheds implemented by it.

A total of Rs. 9.89 crore was spent in the two watersheds, out of which people's contribution amounted to 15.5%.

1.3 Impact of Watershed Programme (EZE and SUJALA)

Impact Parameters

The EZE supported watershed programme came to an end in 2003. Six years after the project, the impacts are quite clearly visible and in many instances are also quantifiable. But the same does not hold true for the Sujala watershed programme. As the project ended in 2008, the impacts are not so visible and quantifiable. But there are some short term impacts that the study has been able to capture. Though impact of any development programme and especially that of a watershed programme spans a large canvas, only direct impacts were taken into consideration for this evaluation.

In the case of Sujala programme, base line data was available, but impact data has yet to be collected by the projects. Hence the data available for Sujala was helpful in understanding the situation that existed in the pre project phase. To understand the post project impact, the evaluation team interacted with the different AGs, watershed committees and individuals within the watershed. Case studies were also conducted to substantiate the information provided by the groups.

In case of EZE, neither the base line nor the impact data was available. Hence data/ information had to be gathered by recollection method and the use of time line.

The impacts were looked at broadly in two domains:

A) Impact on Livelihoods and livelihood strategies: In an agrarian community it is not easy to compute incomes and expenditure using standardised formats. There are many variables and factors that influence a farmers' income that it becomes difficult to capture impact using a standardised format. Further, each farmer's livelihood source is different. Market forces, on which the farmers have no control, play a major role in their livelihood choices; these forces are dynamic and display trend variation on a daily basis. In order to arrive at a clear indicator of increase in incomes, it is necessary to study these variations over a period of time which is beyond the scope of this study.

Hence, this evaluation looks at only a few selected indicators of livelihood impact like:

i. Impact on migration
ii. Change in area under cultivation
iii. Change in cropping pattern (crop diversification)
iv. Change in productivity
v. Change in outflow of produce from village
vi. Change in livestock population and breed
vii. Change in living conditions

B) Impact on natural resources – on soil, water and vegetation. For impact on soil and water, as no data has been collected pre or post project, farmers perception has been taken to assess the impact. Following parameters have been considered for assessing impact on natural resources:

i. Change in soil water retention
ii. Change in water availability
iii. Change in area under irrigation
iv. Change in vegetation
v. Availability of fodder and fuel wood
vi. Change in ground water table
vii. Drinking water availability

A) Impact on Livelihood and livelihood strategies

i) Impact on Migration

In both EZE and Sujala programme areas there has been a clear reduction in number of families going for seasonal migration and even in persons going to nearby villages for agriculture labour. Reduction is to the tune of 40% to 100%. The following two examples help to illustrate the impact on migration.

Myrada started working in RG Camp village of Chitradurga in early 2000. There were 42 households out of which 38 were land owners (5 of whom were big farmers). As resources were limited, Myrada started working with only 8 small and marginal farmers. This work was done on loan basis. At that time, though most of them had lands, around 80% of the families depended on agricultural labour and migrated to nearby villages for 6 to 8 months in a year. In 2003, a rural bank opened its branch in a nearby village. With better access to loan, things started changing for a few big farmers. When Sujala project started and lands of all 38 farmers were taken up for treatment, the situation changed drastically. During implementation of Sujala project in the area none of the families migrated out. After Sujala, with treatment of all private lands and common lands, the natural resources in the area improved – there was increased surface water available, yields of borewells improved, some lands that were uncultivable before (around 30 acres) due to boulders were transformed into cultivable lands after clearing the boulders. With such transformation, farmers started shifting to plantation crops. This shift from agriculture crops to plantation crops started with few big farmers in 2001, but with improved natural resources after Sujala, even small and marginal farmers started converting part of their land into plantations. This changed the economic condition of the farmers. Now, only 8 to 10% of the farmers are going to nearby villages for labour for 4 to 6 months in a year.

In D. Kothindlu village of Kolar, where EZE project was implemented between 1999 to 2003, the impact has been maximum. Migration in this village has stopped completely after implementation of watershed works in the lands of all 45 farmers. Earlier all the families used to go for road construction work or for agricultural labour in the neighbouring villages in the non-agriculture season.

Information collected through Area Group interaction on migration in some of the villages visited is given in the Table below:

Table 6: Impact on Migration in the villages visited

S r. No.	Village Name	Project	Scenario – before	Scenario – After
1.	D.Kothindlu – Kolar	EZE	100% families went out of village on daily basis for work	No one goes out of the village for work.
2.	Venkatapura – Kolar	EZE	90% families migrated to towns like Kuppam, Chitoor and Bangalore throughout the year	Only 10% families migrate to towns. Few families go for agriculture work in nearby villages for 2 months in a year.
3.	Doddadanahalli - Kolar	EZE	80% families went to neighbouring villages on daily basis for work	40% families go to neighbouring villages for work
4.	Aralkunte – Kolar	Sujala	60% of the families went to neighbouring villages for around 8 months in a year	20% families go out for around 4 to 6 months in a year.
5.	Badgutlahalli – Kolar	Sujala	All small and marginal farmers went for labour work outside the village for almost 10 months in a year	All of them still go but number of days have reduced. They now go for 6 to 7 months in a year.
6.	R.G. Camp – Chitradurga	Sujala	80% of the families migrated for 6 to 8 months in a year	10% families migrate for 6 months
7.	Malkapura – Chitradurga	Sujala	5 families went to neighbouring village for labour for 8 months	This is reduced to 3 families going out for 6 months
8.	Padigatta - Chitradurga	Sujala	Around 20 families migrated to work	Only families of marginal farmers go for migration. Due to NREGA programme more work available in village itself

The change in migration in the past few years in all the programme villages is quite evident – only the magnitude differs. In recent years, reduction in migration can also be attributed to the Employment Guarantee programme of the Government – NREGA, that is being implemented rigourously in all the villages.

ii) Change in area under cultivation:

Out of the 9 villages visited, only in one village was there no change in area under cultivation after the project. In all the other villages, the increase in area ranges from 4 Ha. to 20 Ha. In some cases clearing of cultivable land of boulders and thorny shrubs, has added more area under cultivation; in some others, terracing, leveling of land and bunding helped in converting uncultivated land into cultivable fields. The following example illustrates this :

In Doddadanavahalli village of Kolar, a 30-member WDA was formed in 1999. Watershed works supported by EZE started in 2001. Of the 72 Ha. covered under the programme, 11 Ha belonging to small and marginal farmers lay in upper reaches. As the land had a high gradient, farmers were not cultivating it on regular basis. As part of the project, terracing and bunding was carried out on this land, and the entire 11 Ha land was brought under cultivation. Some farmers have even got farm ponds constructed here and have started growing vegetables during rainy season for home consumption. Chinnamuttapal, a marginal farmer owning 1 ½ acre land in this patch says, "I hardly used to get 1 to 2 bags of ragi from my land. After land treatment works were carried out, the yield has almost doubled".

Some of the villages where maximum impact in terms of area under cultivation was reported are listed in Table 7 below:

Table 7: Change in Cultivable area after the project

Sr. No.	Village Name	Project	Scenario – before	Increased cultivable area after the project	Practice adopted
1.	D.Koth-indlu – Kolar	EZE	Top soil erosion, gullies in cultivable land and attack on crops by wild pigs had rendered agriculture non-remunerative	20 Ha belonging to 17 members has been brought under cultivation.	Bunding, gully plugging and agave fencing
2.	Dodda-danahalli – Kolar	EZE	11 Ha of agriculture land was on steep slope and hence unfit for cultivation	11 Ha.	Bench terracing
3.	Aralku-nte - Kolar	Sujala	Top soil erosion, gully formation in cultivable lands had rendered around 20 Ha unfit for cultivation	20 Ha.	Bunding, gully plugging
4.	R.G. Camp – Chitra-durga	Sujala	10-12 Ha land full of boulders	10-12 Ha land was brought under cultivation. Additional 40 Ha was also brought under cultivation. (see note at the end of this table)	Boulder clearance, bunding

Note: In RG Camp village, with increased water availability for agriculture after watershed activities, all farmers started shifting to plantation crops. Even small and marginal farmers started growing banana and arecanut in the lands where they were earlier growing consumption crops. In this village around 40 Ha of land belonging to farmers staying in Bangalore (and other cities) was lying uncultivated. In order to meet their consumption needs, the local farmers started taking this vacant land on lease for growing crops for consumption purpose. This way, both consumption and commercial needs of the farmers were met.

iii) Change in Cropping Pattern – Crop Diversification:

As a result of watershed activities, change in cropping pattern is quite evident in all the villages visited. There is a clear trend to shift towards commercial crops like banana and areca nut (plantation crops), maize, mulberry, sunflower, groundnut, etc. One of the major changes is that farmers have started growing vegetables for consumption purpose. Almost all farmers with farm ponds tend to grow vegetables around the pond, especially during rainy season. Depending on extent of water available some of them also grow vegetables for sale.

According to secondary data, in Hirehalla Sub-Watershed, in 9 out of the 15 micro catchments farmers have started growing vegetables for consumption purpose. Similarly in Gangasamudra Sub-watershed, farmers in 6 out of 8 micro-catchments have started growing vegetables for consumption. Refer Annexure 1b for secondary data on change in cropping pattern in Chitradurga and Kolar.

Crop diversification has taken place in the following two ways: 1) reducing area under consumption crops and replacing with commercial crops; 2) increasing the area under cultivation by taking additional land on lease.

Changes in cropping pattern in some of the villages visited is given in Table 8 below:

Table 8: Change in cropping pattern

Village name	Project	Crops grown – before the project	Shift in cropping pattern – after the project
D Kothindlu – Kolar	EZE	Finger millet, horse gram, red gram - mixed cropping was followed	Finger millet and paddy (for consumption), Vegetables (like potato, tomato, beans, carrot) in irrigated lands Groundnut in non-irrigated lands Mulberry is the main cash crop grown even by small and marginal farmers

Venkatapura - Kolar	EZE	Finger millet, horse gram	Finger millet, horse gram continue to be grown for consumption purpose. Additional dry land crops: sorghum, groundnut Irrigated lands – vegetables
Aralakunte - Kolar	Sujala	Finger millet, lab lab, horse gram, red gram	In addition to existing crops, farmers with irrigation and those having farm ponds have started growing vegetables.
Badagutlahalli - Kolar	Sujala	Finger milliet, dry land paddy, horse gram, lab lab, red gram	No change in crops. 2 to 3 farmers with farm ponds (in lower reaches) started growing vegetables (whenever there is water in the pond)
RG Camp – Chitradurga	Sujala	Minor millets (like Navane, Same), maize, sunflower, sesame, groundnut, finger millet	95% farmers (including small and marginal farmers) shifted to plantation crops like banana and areca nut. Food crops: Finger millet and minor millet (but area reduced) Vegetables by 95% farmers
Malkapur - Chitradurga	Sujala	Maize, finger millet, sesame, green gram, cow pea, ground nut, sunflower	Same crops - but area under maize, sunflower and groundnut has increased, while area under finger millet and sesame has decreased. Cotton – new crop
Mallandahalli - Kolar	Sujala	Finger millet, horse gram, lab-lab, cow pea, red gram. More of mixed cropping Horticulture crop – mango Farmers having irrigation – mulberry, potato, tomato, carrot	In addition to the existing crops, farmers grow chilli, beans, cauliflower, brinjal, cabbage, ladyfinger. Floriculture More of monocropping – mulberry and vegetables
Padigatta – Chitradurga	Sujala	Horse gram, ragi and minor millets – around 15 years back. Shifted to cash crops like maize, cotton, sunflower and ground nut, 8 years back.	Area under maize and cotton has further increased by reducing area under consumption crops. Ragi grown is just enough to sustain a family for a year.

iv) Change in productivity:

In all the villages visited, all the farmers spoke about the increased yield due to soil conservation activities, such as bunding, gully checks, etc. Chikkamumiyappa of Doddadanavanahalli in Toralakki (Kolar), claims that terracing and bunding has increased the soil depth in his land by 6 inches. This has doubled his yield of ragi.

Details of changes in productivity in Hirehalla and Gangasamudra sub-watershed are given in Annexure 1c (For Kolar secondary data was available for only one sub-watershed).

Besides watershed activities, many other factors have contributed to this increase in productivity. Some of them are:

- Shift in seed variety – from local to hybrid
- Use of chemical fertilizers, especially in commercial crops
- Increased sub soil water availability – with improved water availability, farmers invested in drilling more bore wells.
- Change in method of cultivation by some farmers – example: in case of finger millet, adoption of transplantation method in place of broadcasting.

According to secondary data:

- In Hirehalla sub-watershed
  - Average yield of ragi has gone up from 6.6 quintal per acre to 9.4 quintal per acre.
  - Average yield of maize has gone up from 14.5 quintal per acre to 17 quintal per acre.
  - Average yield of sunflower has gone up from 4 quintal per acre to 6 quintal per acre
- In Gangasamudra sub-watershed
  - Average yield of ragi has gone up from 8 quintal per acre to 10 quintal per acre
  - Average yield of maize has gone up from 14 quintal per acre to 17 quintal per acre
  - Average yield of sunflower has gone up from 5 quintal per acre to 7 quintal per acre

(Source – MYRADA Chitradurga Project Reports)

Table 9 below gives data on the changes in productivity in some of the villages visited.

Table 9: Change in Productivity

Village name	Project	Productivity - before the project	Productivity - after the project	Reasons for change
D Kothindlu – Kolar	EZE	Ragi – 3-4 bags/ acre	Ragi – 8-10 bags/ acre	Watershed activities like bunding and water harvesting structures.
Venkatapura - Kolar	EZE	Ragi – 3-4 bags/ acre	Ragi – 8-10 bags/ acre	Watershed activities like bunding and water harvesting structure.
Doddadana-halli - Kolar	EZE	Hybrid ragi: 5 to 6 qntl/ acre. Max upto 10 qntl.	Hybrid Ragi – 15 qntl/ acre	Productivity increased due to silt application, bunding, mixed use of chemical fertiliser and compost
Aralakunte - Kolar	Sujala		Increase in ragi yield by around 2-5 bags per acre.	Shift to hybrid varieties
Badagutla-halli – Kolar	Sujala	Ragi – 1 bag per acre.	Ragi – 5 bags per acre	Watershed activities and shift to hybrid varieties
RG Camp – Chitradurga	Sujala	Maize – 5 to 6 qntl/ acre Ragi – 5 to 6 bags/ acre	Maize – 8 qntl/ acre Ragi – 10 to 12 bags/ acre	Watershed activities
Malkapur – Chitradurga	Sujala	Maize (hybrid) – 10 to 12 bags/ acre Ragi (hybrid) – 5 to 6 bags/ acre	Maize (hybrid) – 20 bags/ acre Ragi (hybrid) – 10 bags/ acre	Use of chemical fertilizers has increased as farmers feel that increased water retention in the field helps sustain the effects of chemical fertilizers for a longer time
Mallandahalli – Kolar	Sujala	Vegetable – sale to market – 4 to 5 lorry loads Ragi – 6 to 7 qntl/ acre	Vegetables – 20 to 30 loads Ragi – 10 to 15 qntl/ acre	Increased number of bore wells Shift from local variety to hybrid variety and use of chemical fertilizer along with farmyard manure
Padigatta – Chitradurga	Sujala	Maize – 15 gntl/ acre Cotton – 6 qntl/ acre (DCH) Ragi – 8-10 qntl/ acre Sesame – 4 qntl/ acre	Maize – 20 qntl/ acre Cotton – 8-15 gntl/ acre (MICO) Ragi – 3-4 qntl/acre Sesame – 2-3 qntl/ acre	Increased yield in cotton is due to change in variety. Some of the farmers have shifted to BT cotton in the last 4 years According to farmers yield of ragi and sesame has declined due to increased use of chemi-cal fertilizers.

As seen in the table above there has been a definite increase in productivity; the change varies from village to village and depends on a variety of factors ranging from impact of watershed activities to a shift in variety of seeds and the use of chemical fertilisers. Amidst all these influencing factors it is difficult to attribute the change to watershed activities alone. A cause for concern is the opinion expressed by farmers in Padigatti that ragi and sesame yields have declined due to increased use of chemical fertilisers. If this is so, it needs to be explored further.

Examples of some of the farmers who experienced a change in productivity :

Farmers name	Ragi (in bags/ ac)		Reasons for increase
	Before	After	
Roopashri of Aralkunte village	4	8	shift to hybrid, bunding
Venkatamma of Aralakunte	6	8	due to bunding
Muniratna of Badgutlahalli	4	6	due to bunding
Mangamma of Badgutlahalli	6	10	bunding, timely de-weeding
Sidramappa of Padigatti	3	5	bunding,

In Mallandahalli in Kolar district, besides agriculture, silk worm rearing is an important occupation. Traditionally around 10 households with irrigation were growing mulberry and rearing silk worms. But from the past 4 to 5 years around 40 households have taken up this activity. All of them have drilled borewells for irrigating their mulberry crop. Government is also promoting this activity by providing hybrid variety of mulberry and by giving subsidy (upto 45%) for drip irrigation in mulberry plots. The families rearing silk worms have also been exposed to a different method of rearing worms – the stand system (China system). This system of rearing has many advantages over the traditional tray method of rearing and the quality of the cocoon is superior and fetches more price in the market.

Palar River Left Bank sub-watershed, Kolar received the National Productivity Award in 2009 for watershed works carried out between 2005-06 and 2008-09.

v) Change in outflow of produce from village

One of the major changes after the watershed activities in the villages is the increase in the quantum of vegetables grown and sold. This is due to increase in water availability, either of surface water or sub-surface water. In some villages like RG Camp, where most of the farmers have turned to plantation crops like banana and arecanut after the watershed programme, there has been good income for the farmers. Even small and marginal farmers in this village are shifting to plantation crops; they clearly indicate increased water availability in the area as the main reason.

Inflow of resources and outflow of produce is one of the important indicators to gauge the economy of a place. Increased productivity and outflow of produce in the watershed villages indicates the positive impact that watershed activities and other factors (like changed cropping pattern, new variety of seeds, increasing use of chemical fertilizers) have had on the income of the farmers.

Table 10 below gives the impact of watershed on the outflow of produce.

Table 10: Change in Outflow of produce from the village

Village name	Project	Outflow of produce – before	Outflow of produce – after
D Kothindlu –Kolar	EZE	None	Cocoons Milk and vegetables
Venkatapura – Kolar	EZE	Milk	Vegetables, milk
Aralakunte – Kolar	Sujala	Milk, tomato, cocoons, eucalyptus, lab lab	Same as before + other vegetables such as beans, cucumber
RG Camp village – Chitradurga	Sujala	Maize, groundnut, ragi, sesame Oil seed : Sunflower	Maize, ragi, sesame Plantation crops – areca and banana (major exports)
Malkapur – Chitradurga	Sujala	Maize	Outflow of maize and cotton doubled. (BT cotton since 2 years) Other crops – Sesame, green gram
Mallandahalli - Kolar	Sujala	Potato, mulberry Mango Vegetable: sale to market – 4 to 5 lorry loads	Potato, mulberry mango and papaya Vegetables – sale to market – 20 to 30 lorry loads Flowers

(Source – As reported during interactions with Area Groups and WDAs)

vi) Change in livestock population and breed

Out of the 9 villages assessed, 4 villages reported gradual decline in cattle population over the past 5 to 10 years; the remaining 5 reported an increase. Easy availability of loans, especially from SAGs (and also from WDAs), is one of the major reasons for increase in the livestock population. It is often said that small ruminants like sheep and goats are poor peoples' ATM. Many cases have been recorded during this study where families have gained upto twice their investment within 6 months by investing in one to two sheep/ goats. Myrada had always believed in and promoted this kind of investment. Reasons quoted for decline in livestock population mostly relate to maintenance problems – especially in cases where each household owned more than10 to 15 local breed cattle earlier. But there is also a case where watershed activities have had a negative impact on cattle – in Malkapur village of Chitradurga, excess water logging caused disease among the cattle. Refer Table 11 for further details.

Examples of impact of livestock on incomes:

1: Muniratnamma of Badgutlahalli has taken two loans from her group. The first loan was of Rs.13000 with which she purchased 6 sheep. Over the years this flock multiplied. In three years she has sold 4 sheep, earning Rs. 8000. She now has around 11 sheep, each of which she estimates will fetch a minimum of Rs. 2000.

2: Venkatamma of Aralakunte purchased a sheep in 2006 by taking a loan of Rs.2000 from her SHG. Over the years she multiplied her stock to 6. In the past 3 years she has sold 4 sheep for Rs.9000 and at present she has 3 sheep at home, which according to her could fetch another Rs.7000 to 8000.

Table 11 : Change in Livestock Population

Village name	Project	Livestock population – before	Livestock population – after	Comments
Villages where population of cross bred cows has increased in past 5 to 10 years:				
D Kothindlu – Kolar	EZE	Local breed owned by a few households 10 families owned goats No dairy	All households have minimum 1 or 2 cross-breed cows, some even have 3 to 4. Local breed cows are there, but fewer in number. Dairy: 200 lts per day from village Only 3 families own goats	Easy availability of loans in WDAs and SAGs.
Doddadanahalli - Kolar	EZE	Milk sale – 60 lts to dairy everyday	Milk sale: 100 lts per day Sheep population increased by 50% Big farmers have bullocks and cross breed cows Small farmers have sheep, goat, local breed cows (less of hybrid ows)	Increased sheep population due to easy low cost loans from SHG
Badagutlahalli - Kolar	Sujala	No cross breeds; Milk sale: 70 to 80 lts per day	More local variety of cows – in each house 2 to 3 local cows 8 cross breed cows. Milk sale: 100 lts per day Increase in number of sheep and goats as compared to pre project period	Purchased with loans from SHG
Aralakunte - Kolar	`Sujala	Bullocks, sheep and local breeds of cows Milk production in village – 80 lts per day	Mostly cross breed cows - around 1-2 cross breeds per house Milk production – 300 lts per day	
Mallandahalli – Madderi - Kolar	Sujala	Milk for sale from village – 80 to 240 lts per day	Milk for sale from village – 320 to 480 lts per day Number of cattle same, but shift from local breed to cross-breed cows	
Villages where livestock population decreased during the past 5 to 10 years:				

RG Camp – Chitradurga	Sujala	Dairy was the primary activity Every day around 200 lts was sent to dairy from the village	Total No. of Cattle reduced More local breed cows Every day around 20 lts is sent to dairy from the village	With increase in plantation activities, families found it difficult to maintain cattle. Sold cross breed cows as they are difficult to maintain As milk yield from village declined, Govt. dairy shifted out of the village. A local dairy is operating now.
Malkapura – Chitradurga	Sujala	Goats – all local variety 10 House-holds had goats at 10 to 25 per household All house-holds have around 2 cows and 1 pair of bullocks.	Except 2 households all sold goats No. of cows same	Watershed activities in and around this village, led to excess soil moisture reten-tion almost to the extent of water log-ging. When the goats has to cross this type of soil while returning from grazing, they started developing a disease in the foot. Many goats in the village succumbed to this disease. Afraid of this, all the families sold their flocks.
Venkatapu-ra - Kolar	EZE	More lo-cal breed cows	Cow population has come down by 50% Fewer cattle – most of them cross bred	As all children have started going to school, free-grazing the cattle has be-come difficult. Now mostly stall-fed
Padigatti – Chitradurga	Sujala	10-15 families had goats. More cows – sent 150 lts/ day to dairy	3-4 families (very small farmers) have goats. Cattle population declined. Dairy closed 3-4 years back.	Reduced area for grazing; one of the reasons being more lands brought under cultivation

(Source – As reported during interactions with Area Groups and WDAs)

vii) Change in living condition

A positive change in living conditions in the past 3 to 8 years was clearly indicated by all the groups, families and individuals with whom the study team interacted. Improved housing condition, addition of toilets to existing house, increased assets like two wheelers, TV and house site, compulsory education for children, better food security, more sets of clothes in a year for family members, were some of the indicators of improved living condition as reported by people. People attribute the change to many reasons: increase in yield and on farm incomes, increase in number of youth working in cities, improved access to loans from SAGs/ WDAs and formal financial institutions, assistance (subsidies) by Govt. for some programmes like silk worm rearing, etc.

Changes in living conditions as indicated in some of the villages visited are given in Table 12 below:

Table 12: Changes in living conditions – the transformation recorded is during the past 3 to 8 years.

Village name	Project	Changes after the project
D Kothindlu – Kolar	EZE	100% food security All 42 families have shifted from thatched roof to tiled roof Almost all have got rooms for silk worm rearing 8 houses have toilets. All houses have gas connection Members have taken loan from WDA for purchase of TV
		All members have purchased TVS scooter All children going to school; high school children go to Kamasamudram
RG Camp - Chitradurga	Sujala	50% of the families who had thatched roof have now got RCC roof. All youth are educated and all children are attending school Almost all in the village have mobile phones Increased bank transactions, loans to SAGs and watershed associations
Aralakunte – Kolar	Sujala	Better food security Low cost SAG loans for marriage, sheep rearing, cattle, agriculture, education etc.
Badagutlahalli– Kolar	Sujala	Better food security All children going to school; go to neighbouring village for high school Low cost SAG loans for health, education
Padigatti – Chitradurga	Sujala	All houses in the village have been renovated.

(Source – As reported during interactions with Area Groups and WDAs)

Note: Members recollected the general situation of families in the village as it was before and as it is now. It was not possible to collect exact figures on number of households that have improved food security, though it was reported in many villages that there is an improvement in this regard. Similarly, many villages reported that more children are now going to school than before.

In EZE villages where the activities were completed around 6 years ago, the impact is more evident. For example in D. Kothindlu village, the land rates after the watershed treatment has more than doubled. The land rates that were around Rs. 25000 to Rs.50000 per acre in 2001-02 have increased to Rs. 1 lakh per acre in 2010. However this could also be due to reasons other than watershed treatment as land rates have generally risen in these areas.

B. Impact on Natural Resources

i) Change in soil water retention

One of the major impacts of watershed activities, especially of activities like bunding, nala training and regeneration has been greater soil and moisture retention for longer periods. All the farmers reported increased surface water retention upto two times the earlier capacity in their fields. This has been one of the reasons for increased productivity according to farmers. Table 13 below gives the increase in duration of soil water retention after watershed works in 6 of the villages visited.

Table 13: Impact on surface soil water retention

Village name	Project	Soil water retention – before the project	Soil water retention – after the project
RG Camp – Chitradurga	Sujala	8 days	15 days
Malkapur - Chitradurga	Sujala	7 days	15 days
Padigatti – Chitradurga	Sujala	8 days	15 days
Mallandahalli – Kolar	Sujala	4-5 days	10-15 days
Aralakunte – Kolar	Sujala	5 days	25 days
Badagutlahalli- Kolar	Sujala	7 days	11-12 days

(Source – As reported during interactions with Area Groups and WDAs)

All the farmers indicated that activities like bunding and construction of waste weirs across gullies in the field has helped in controlling soil erosion and arresting water run off, thus increasing soil moisture retention capacity and finally impacting on the yield. Two cases of such farmers are given below:

Case 1: Chikmuniyappa of Doddadanahalli village in Kolar owns land on a high slopy terrain. After doing terracing on his field, he claims an increase in soil depth by 6 inches. He was not growing any crop before due to the excess slope resulting in excessive soil erosion and water run-off.

Case 2: Sidramappa owns 2 acre 10 guntas of land in Padigatti. Apart from regular crops like ragi, maize and groundnut, he also has coconut and areca nut trees. Due to continuous erosion, his land had developed deep gullies. Because of this, his crops suffered. With the support of Sujala he had 2 waste weirs constructed in his land. He also did bunding. He said that gradually the treatment helped in increasing the yield by almost 1 ½ times.

ii) Change in water availability (ground water table, surface water)

Before

After

Out of the 5 villages which gave information regarding the status of ground water table, 4 reported increase in the same after watershed activities. Some villages reported good surface water retention after watershed activities. In all the villages there has been a definite increase in the number of bore wells, but it is difficult to pin point one reason for the sudden spurt. People however identify the watershed programme as one of the contributing factors. People have gone in for bore wells, mainly because of increased ground water or because, after watershed activities, the land held better promise of improved productivity. Apart from increased number of bore wells, some defunct bore wells have also started yielding water. In some cases bore well yield has increased after watershed works.

Following Table 14 gives information about changes in water availability in the villages visited.

Table 14: Change in water availability in the watershed

Village name	Project	Before	After
D Kothindlu – Kolar	EZE	Ground water available - 600 ft 2 to 3 bore wells – went dry during summer	Ground water table - 200-300 ft 10 dry bore wells revived after watershed works. Around 20 new bore wells over the past 10 years. During 2001-03 when there was a drought and most bore wells in the area went dry, 10 wells in this village remained active. Surface water: In the check dam there is always some standing water. Hence drinking water for cattle is now no longer a problem
Venkatapura – Kolar	EZE	Only 4 to 5 farmers had bore wells for irrigation	3 new bore wells after the project. 8 farmers benefit from Check Dam. (as per group rules do not lift water through pump sets but use run off water for irrigation)
Doddadana-halli – Kolar	EZE	7-8 bore wells Ground water table available - 100 ft	20 bore wells Ground water available – 700 – 800 ft.
RG Camp – Chitradurga	Sujala	Ground water available – 200 ft 25 to 30 bore wells Borewell yield – 1” **Surface water** Gowdahalli kere – water only upto Dec.	Water available l – 100 ft. 7 to 8 new bore wells over a period of 6 years Borewell yield – 1 ½ ” **Surface water** Gowdahalli kere – water thru out the year 7 to 8 new cattle ponds built under Sujala – water available upto Feb./ March
Malkapur – Chitradurga	Sujala	Water availabile at 300 ft	Water available – 150 ft 5 bore wells recharged.
Padigatti – Chitradurga	Sujala	20 farmers had bore wells, out of which 8 had stopped functioning	All bore wells functioning with water at 200ft or above; have increased water level and yield (from 1 in to 2 in). Bore wells with water at 700 ft or below have seen no improvement. Some bore wells now have water at 150 ft and even 50ft. 8 bore wells were recharged.
Aralakunte – Kolar	Sujala	Lake used to fill immediately after a rain bringing in a great quantity of soil	Takes 2 days to fill – since flow of water is slowed down by structures in the upper reaches; less soil deposit

Mallandahalli – Kolar	Sujala	10 borewells Ground water available – 200-300 ft	15 new borewells 4 dried up wells recharged after Sujala Ground water available – 400-500 ft. (during low rainfall years it goes down to 700-1000 ft.) Farmers have responded to the situation by adopting water conservation measures such as drip-irrigation
Badagutlahalli – Kolar	Sujala	5 farmers had bore wells Ground water table – 400-500 ft	No more bore wells – all dried up 20 farmers have farm ponds Ground water table – 700-1000 ft

(Source – As reported during interactions with Area Groups and WDAs)

In three villages above (Doddadanahalli, Mallandahalli and Badgutlahalli) the water level in bore wells has gone down which is a cause for concern.

According to secondary data provided, in Gangasamudra sub-watershed, all the existing bore wells have reported an increased yield of around ½ inch to 1 inch. 89 bore wells that had become defunct were revived as an impact of the project. Number of tanks has gone up from 14 to 17. Period of water availability in these tanks has also gone up by 1 to 3 months. Tables 15 and 16 below give details of these changes micro-watershed wise.

Table 15: Change in water availability in Gangasamudra sub-watershed

Micro-watershed name	Irrigation – No. of bore wells		Yield of bore wells (in inches)		No. of bore wells re charged *	Ground water table (in feet)		Surface water - No. of tanks		Availability of water in tanks - how many months in a year	
	Before	After	Before	After		Before	After	Before	After	Before	After
Gollarahalli	210	225	1.5	2	8	250	200	2	2	5	7
Hosahatti	150	164	1.5	2.5	14	300	200	1	2	6	7
Ganagasamudra-1	175	185	2	2.5	6	250	175	1	1	5	6
Ganagasamudra-2	260	282	1	2	17	300	250	3	4	4	6
Arabagatta	215	230	1.5	2	11	250	175	1	1	4	7
Bidarkere	145	164	1.5	2.5	9	250	200	2	2	4	6
Muddapura	220	265	1	1.5	14	250	175	1	1	4	6
Jakkanahalli	174	186	1.5	2.5	10	200	175	3	4	5	7
	1549	1701			89			14	17		

*those that were dry before watershed works

(Source – Gangasumudra Sub-Watershed Completion Report submitted to District Watershed Department, Chitradurga, 2008)

Similarly, positive changes are also recorded for Hirehalla sub-watershed in Chitradurga. A total of 250 new bore wells have been drilled after the watershed project. The yield in the existing borewells has also gone up by ½ inch to 1 inch. 243 bore wells that had dried up, were revived after the watershed activities. Ground water table has also gone up by 50 to 75 feet in all the micro-watersheds. 10 more surface water tanks have been created as part of the project and existing tanks have started holding water for additional 2 to 3 months.

Table 16: Change in water availability for irrigation in Hirehalla sub-watershed

Micro-watershed name	Irrigation – No. of bore wells		Yield of bore wells (in inches)		No. of bore wells re charged *	Ground water table (in feet)		Surface water - No. of tanks		Availability of water in tanks - how many months in a year	
	Before	After	Before	After		Before	After	Before	After	Before	After
Apparasa-nahalli	198	225	1.5	2.5	25	250	150 to 200	3	3	5	7
Channap-atna	209	215	1.5	2	15	300	250	2	2	4	6
Arasanag-atta	800	812	1.5	2.5	12	250	200	3	4	4	6
Chikkand-avadi-1	162	178	1.5	2	16	300	250	1	1	5	7
Chikkand-avadi-2	311	345	1.5	2	28	300	225	4	5	4	6
Banagere	500	515	1.5	2	15	150	200	1	1	5	7
Gundimadu	400	406	2	2.5	6	150	200	3	3	4	7
Kunagali	66	82	1.5	2.5 to 3	16	250	200	2	3	5	8
Shivapura	450	478	1.5	2.5	17	300	250	2	3	5	7
Abradasi-katte	390	408	1.5	2.5	18	250	175	1	2	4	6
Chikkana-katte	180	188	2	2.5	8	250	200	1	2	4	6
Hosahalli-1	510	522	1.5	2.5	14	250	200	1	1	4	6
Hosahalli-2	72	95	1.5	2.5	21	150	200	5	7	5	7
Agrahara	350	360	1.5	2	8	300	225	0	1	5	7
Maddena-hatti	601	625	1.5	2.5	24	250	200	3	4	4	7
	5199	5454			243			32	42		

*those that were dry before watershed works

(Source – Hirehalla Sub-Watershed Completion Report submitted to District Watershed Department, Chitradurga, 2008)

Such secondary data was not available for the 4 sub-watersheds of Kolar.

iii) Change in area under irrigation

After the watershed activities, with increased water availability due to increased number of bore wells or increased yield of bore wells, many of the farmers have increased the area under irrigation. According to secondary data available in Hirehalla sub-watershed, irrigated land has increased by around 10 to 35 Ha. in each micro-watershed, and in case of Gangasamudra sub-watershed, the increase is between 15 to 33 Ha. in each micro-watershed. This is also corroborated by the information gathered during field visits by the study team.

Table 17 gives the change in irrigated area in Hirehalla and Gangasamudra watershed after the project.

Examples:

1. In D. Kothindlu village (EZE project), around 3 Ha of land was irrigated before the project. After the project, over a period of 8 to 10 years, the area under irrigation is around 24 to 28 Ha. This increase is due to improved ground water table (from 600 ft to 200-300 ft) and an increase in the number of bore wells (from 10 bore wells to 30 bore wells). Earlier most of the bore wells went dry during summer, but after the watershed works it was observed that even in severe drought years when all the bore wells in the neighbouring villages went dry, in D. Kothindlu, atleast around 10 bore wells would be running.
2. Similarly in Mallandahalli village (Sujala project), area under irrigation after the project increased by 30 Ha. Before the watershed works the village had 10 bore wells, which increased to around 30 within a period of 4 to 5 years. But with increase in number of bore wells in this village, the ground water table has declined from 200-300 ft to 300-500 ft. This situation has led the farmers, who are mostly vegetable and mulberry growers to adopt drip irrigation. According to M. Ratnamma, EC member, "With adoption of drip technique for irrigation, we are able to irrigate double the extent of land".

   But there were also some villages like Badgutlahalli and Aralakunte (both Sujala villages), that reported no change in area under irrigation.

Sub surface dam

Table 17: Change in area under irrigation in Sujala sub-watersheds in Chitradurga

Hirehalla sub-watershed			Gangasamudra sub-watershed		
Name of micro-watersheds	**Irrigated land (in Ha.)**		**Name of micro-watersheds**	**Irrigated land (in Ha.)**	
	Before	After		Before	After
Apparasanahalli	180	202	Gollarahalli	265	285
Channapatna	152	168	Hosahatti	215	235
Arasanagatta	410	440	Ganagasamudra-1	175	190
Chikkandavadi-1	140	175	Ganagasamudra-2	310	340
Chikkandavadi-2	220	235	Arabagatta	112	145
Banagere	145	155	Bidarkere	362	380
Gundimadu	230	242	Muddapura	155	175
Kunagali	61	92	Jakkanahalli	170	195
Shivapura	253	271	**Total**	**1764**	**1945**
Abradasikatte	387	405	**Area under irrigation increased by 10.3%**		
Chikkanakatte	203	215			
Hosahalli-1	125	140			
Hosahalli-2	112	135			
Agrahara	358	365			
Maddenahatti	222	248			
Total	**3198**	**3488**			
Area under irrigation increased by 9%					

(Source – Gangasumudra and Hirehalla Sub-Watershed Completion Reports submitted to District Watershed Department, Chitradurga, 2008)

Secondary data on increased area under irrigation for Sujala watersheds in Kolar was not available for analysis.

iv) Change in vegetation

Myrada is a pioneer in integrating forestry and vegetation, both through regeneration and plantation in watersheds as part of a strategy to 'bring the soil back to life'. As part of EZE watershed programme Myrada promoted bund and road side plantations with fodder and fuel wood species especially those that could be used as compost. Non browsable and drought tolerant species mainly cassia siamea were planted along the field bunds in large numbers. They were pruned every year after attaining a height of around 6 ft. The branches were stripped of their leaves that were left to decompose in the field or composted in pits in the field itself; the stripped branches were sun-dried and used as firewood. Over time it was seen that cartloads of leaf manure could be generated that enhanced soil quality and improved moisture retention. The branches helped meet the family's fuel wood needs to the extent that after 5 to 7 years, many families reported that they no longer gathered firewood from forests and common lands nor did they purchase any from the market. Even though in the EZE project an exact estimation of number of trees planted is difficult, data gathered from various reports gives an approximate figure of 27,06,189 trees planted on bunds, on road sides, common land and as part of farm forestry activities. The extent of greenery visible in this project area is proof enough to justify the rough estimates.

Biomass on bunds

Influenced by positive results under the EZE project, importance to improve vegetative cover was also given importance in Sujala both in Chitradurga and Kolar. Bio-mass plantation became an important part of Myrada's watershed strategy across all projects. A total of 86,484 rmt of bunds, 51 km of road side, 326 Ha. of common land and 387 Ha. of private land was planted with species like tamarind, neem, cassis siamea, teak, pongemia, custard apple etc. in Chitradurga (in the two sub-watersheds together). Similarly a total of 13 lakh rmt of bunds, 86 km of road side, 269 Ha. of common land and 2394 Ha. of private land was planted with different forestry species in Kolar

(in all 4 sub-watersheds taken together). Micro-watershed wise details of these are given in Annexure 1d.

Initially farmers in Sujala watershed area showed some reluctance to plant on bunds, citing 'shade to crops' as the reason. But, when these farmers were taken on an exposure visit to EZE project areas, they were convinced and agreed to undertake planting activity on bunds. Preferred species for bund plantation was cassia semia which was pruned regularly thereby reducing shade and preventing the roots from extending into the fields. Other species like teak, pongemia, silver oak, neem and some horticulture species like tamarind, jack fruit, gooseberry and jamoon were also planted along the road side and on common land. In private land, agro forestry was promoted with crops interspersed with forestry species.

Before (1995)

After (2003)

An example in managing common land resources:

Management of common land was minimal in most of the Area Groups/ WDAs/ ECs visited, except in D. Kothindlu where the farmers with land adjoining common lands were made responsible for its maintenance. In return they were also promised a 70% share from the income earned out of the common land, while the WDA got 30%. One crop of trees has already been harvested and sold, and the proceeds shared in the above manner. In fact D. Kothindlu farmers (WDA) have also negotiated with GP to gain usufructs rights for eucalyptus plantation done on GP land during the project period. WDA roughly estimates an income of Rs.10000 from 50 eucalyptus trees.

In EZE project the vegetative cover is clearly visible due to well grown trees (over a period of 8 to 10 years). In case of Sujala, the impact is not yet so pronounced (visible), as the project ended only 2-3 years back.

Table 18 gives the extent of forestry activities undertaken in the micro catchments (MMCs) visited.

Table 18: Plantation activities in the MMCs visited

Micro Catchment	Bund plantation (in rmt)	Roadside plantation (in km)	Common land plantation (in Ha.)	Private land plantation (in Ha.)
RG Camp	5300	6	8	72
Padigatta	1200	Nil	6	45
Malkapura	2800	3	10	50
Aralakunte	26424	4	2.5	84.34

Horticulture:

In Sujala project, apart from forestry activities, horticulture was also promoted on agricultural lands as agro-horticulture or in private uncultivated lands. A total of 2,40,475 saplings covering 3560 Ha. were planted in both Chitradurga and Kolar together under Sujala project. Mango was the most preferred species among farmers; sapota and pomegranate saplings were also planted.

Secondary data available for the Sujala watershed projects provides the following information on Horticulture:

Table 19: Horticulture plantation in Sujala sub-watersheds

Name of sub-watershed	No. of plants	Area (in Ha.)
Gangasamudra	35562	244
Hirehalla	101966	889
Palar River Left Bank	36545	387
Palar River Right Bank	28419	387
Mustrahalla	22537	225.37
Markandahalla	15446	1427
Total	240475	3559.37

(Source – MYRADA Internal Project Reports)
Data on Plantations Micro-watershed wise information is given in Annexure 1e

v) Availability of fodder and fuel wood

A considerable change with regards to availability of fodder and fuel wood has taken place in EZE project areas. In most of the Sujala watershed villages, people reported 'no change' in availability of fodder and fuel wood after the Sujala project. However, it must be noted that the Sujala project is a recent one.

Table 20 gives a summary of the impact of watershed activities on availability of fodder and fuel wood in the villages visited. This impact was reported during interactions with Area Groups (WDAs). Secondary data is not available, either for EZE or Sujala project.

Table 20: Impact of watershed activities on fodder and fuel wood

Name of village	Project	Impact of watershed on fodder and fuel wood availability
D Kothindlu	EZE	LPG gas cylinders and kerosene stoves are being used for cooking. Earlier few families were buying fodder. Now no one buys fodder, as enough is grown on lands/bunds
Venkatapura	EZE	"Had to walk 4 kms to fetch fire wood before. Now it is available within 1 km".- reported by member of WDA
Doddadanahalli	EZE	"Fodder and fuel wood is now available on bunds. Earlier we had to go to the forest for the same". reported by member of WDA
RG Camp village	Sujala	Availability of fuel wood was not a problem in this village due to easy access to nearby forest and from agri waste. 15 families had bio-gas plant before the project period. With reduction in number of cattle, 5 families stopped using the same. With reduction in food crops grown by the farmers, fodder availability is also reduced.
Malkapur village	Sujala	No change.
Mallandahalli	Sujala	Availability of fodder and fuel wood has never been a problem.
Aralakunte	Sujala	Had to purchase fodder during low rainfall years and in summer. Condition remains the same after the project. Used to get firewood from nearby forest. Still continue the same practice. Many households have now shifted to use of LPG gas for cooking as this was promoted by SAGs.
Badagutlahalli	Sujala	"Fodder was available in the watershed before, but sometimes we had to borrow from neighbours' field. After the project, most of the time fodder is available on one's own land (especially in rainy season)". – reported by member of AG

(Source – As reported during interactions with Area Groups and WDAs)

vi) Availability of Drinking water

There has been no problem related to drinking water in all the villages visited. All the villages are being provided drinking water by Panchayat bore wells from the past 10 to 12 years.

1.4 Overview and Conclusion

As observed in the villages visited as part of this evaluation, there has been a definite change in the livelihoods in the recent 3 to 8 years; the extent of change however varies from one village to another. Though watershed activities alone are not responsible for the impact on livelihoods of the people, they triggered the change. For example, in R.G. Camp village, after watershed activities were started in 2000 with a few farmers, a number of changes started happening. Farmers whose lands were treated took loans and converted to plantation crops due to good water sources created. A bank opened its branch in a nearby village. When later under Sujala watershed project all the farmers' lands were covered, almost all the farmers shifted to plantation crops. This changed the economy of the entire village. With good water availability even small and marginal farmers have shifted to growing banana and areca. These farmers take additional land on lease for growing food crops. Thus over a period of 5 years, area under plantation has increased from 10% to 25%.

To understand the impact of watershed on livelihoods, the transformation of D. Kothindlu village is a good example. WDA members mentioned that their introduction to watersheds was when they were working as labourers in the adjacent village of Balamande when another EZE-sponsored watershed was being implemented. They approached Myrada with a request to implement a similar programme in their village and that is how the programme started in their village. Almost the entire population had a hand-to-mouth existence before watershed works. Now, the same village has become one of the important markets for cocoons. Besides this, every day 200 ltr of milk is sent to the dairy from this village. Up till now, the WDA has taken a loan of Rs. 19 lakh from the bank – all repayments have been on time. The WDA has a common fund of Rs. 8 ½ lakh, of which savings alone is Rs. 1.05 lakh and interest is 4.02 lakh. This WDA actively participates in other village development activities, and has even funded some important works in the village.

In Aralakunte there are 6 SAGs and each of the SAGs has a common fund of Rs. 2 to 2 ½ lakh. Average loan per member is in the range of Rs. 30,000 to Rs. 50,000. Increased capacity to absorb loans is one of the indicators of growth and improved livelihoods/sustainability. In Venkatapura, dependency of farmers on daily wages has reduced as they have started growing paddy and vegetables. In Mallandahalli, sale of milk and vegetables to the local market has almost doubled.

Though these changes have been triggered by watershed activities, there are other factors that are equally responsible for the improved livelihoods. To name a few: advent of formal financial institutions in the villages, government schemes with subsidies, improved connectivity and communication, better job opportunities in towns and cities, etc.

According to Mohan of D. Kothindlu (EZE Project area in Kolar), "When we were small, none of the children went to school – in fact there was no school for 3 to 4 km. We did not have proper clothes to wear. Parents used to go for road repair works outside the village. Most of the families were going out of the village for work. Gradually all this started changing when in 2000, as part of watershed activities our lands got treated. Productivity of land improved, and ground water table also improved. Families started returning to their land and cultivating. WDA helped people take loans for land treatment and other works. Thus, the change began ……Today, all the families have got pucca houses in the village, all children are going to school. Migration has completely stopped. Recently all WDA members took loan from WDA and purchased two wheelers".

Impacts on natural resources are also quite evident – there has been a positive change in productivity in both EZE and Sujala villages after land treatment works; water availability in terms of increased yield in borewells, recharge of dried up bore wells, improved surface water sources – these are all indicators of improved natural resources.

Impacts in case of EZE watersheds are more evident as the works were undertaken almost 10 years back. As Sujala is a more recent project, the impacts have yet to be fully visible. Most of the EZE villages for example, have become self sufficient in fodder and fuel wood. But in case of Sujala villages people reported 'no change' in availability of fodder and fuel wood after the project.

Apart from implementation of watershed activities guided by sound technical know how, what h as really helped to improve people's livelihood, is the institutional approach to watersheds. This approach which has been core of all Myrada programmes from the very beginning, has ensured sustainability of the efforts and impacts in watersheds. In the fourth phase of EZE, learning from all past experiences, Myrada found that the WDAs could function on the same lines as SAGs. Even today in EZE villages these WDAs function like SAGs and give credit for land related activities. Roopashri's case, given at the end of this report is a good example of how a blend of land based and non-land based activities, implemented through community based institutions, helped in improving a family's livelihood base.

On one hand, where the watershed programmes of Myrada have presented a positive image regarding the impacts, there are also a few concerns that need to be addressed. As an after effect of increased / improved water resources, the number of bore wells has increased in the watershed area. For example, in Gangasamudra 150 new bore wells have come up in the past 3 to 4 years. Similarly in Hirehalla sub-watershed 250 more bore wells have been drilled. If this trend continues, it will not take long for the impact of watershed works to decline rapidly. Hence, it is very essential to introduce the farmers to water management techniques after the watershed activities. Mallandahalli in Chitradurga

has taken a lead here. After the watershed activities, within 3 years, 15 new bore wells were installed. A larger area came under commercial crops like mulberry and vegetables. Ground water level dipped from 200-300 ft. to 400-500 ft. Farmers then decided to adopt drip irrigation system that was being subsidized by Government. Such practices must be promoted aggressively in all watershed programmes.

Another area of concern, was the immediate shift to commercial crops after the watershed activities. This is quite evident from data given in this report. On one hand, shifting to commercial crops fetches better income for farmers, but on the other hand, it also undermines food security. This becomes a problem, especially when small and marginal farmers fully convert to commercial crops, more so in the context of rising food prices. Hence, it is always advisable to promote a cropping system that addresses farmer's food security as well provides income from land. Farmers of RG Camp have set a good example in this regard. After the watershed, even the small and marginal farmers shifted to plantation crops. But, to address the issue of food security, they took additional land on lease and started cultivating cereals. These lands belonged to farmers who had settled in cities/towns and left the lands fallow for several years. SAGs and Area Groups helped the farmers to access loans for taking land on lease.

Increased availability of water and the subsequent shift to commercial crops prompts many farmers to start using chemical inputs in larger quantities. This will surely have a negative impact on soils and productivity. Since Myrada is also promoting organic farming and LEISA on its projects, this practice needs to be introduced in watershed areas.

1.5 Case studies

Poor families have a livelihood strategy comprising several activities. They adopt new ones or increase investment in older activities according to their needs, availability of time and labour and at a pace that they can cope with. The following case studies are quite typical of a family's livelihood strategy.

Case 1:

Roopashri's family in Aralutakunte village

Roopashri and her husband own 2 acres of dry land. They were growing Ragi, red gram, horse gram and Lab-lab. Productivity of the land was low and they could just get enough Ragi and red gram to meet their consumption needs. They used to sell part of horse gram and Lab-lab.

Through the assistance of Sujala project they got bunding done on their land and also planted forestry species on the bunds. For this they spent Rs.7000 from the project and invested Rs.700 from their own funds. At the same time they also shifted from local variety of Ragi to hybrid. This change in seeds along with land treatment doubled their productivity. As compared to 4 bags of Ragi that they were getting earlier, they started getting 8 bags now. Similarly, they shifted to hybrid variety for red gram also. They started selling Ragi and Red gram, after keeping aside enough for home consumption.

As part of skill training (in Sujala), Roopashri attended a 45 days tailoring training in Kolar. Taking a loan of Rs.10,000 from the SHG and investing Rs.10000 of her own, she purchased two motorized sewing machines. She put these in her mother's house (as it was more spacious) and started stitching women's garments, bags, purses, etc. Her mother who knew tailoring, joined her and together they started making a minimum profit of Rs.2000 per week. They also conducted tailoring classes charging Rs.100 / month per student. This ensured that the machines were always engaged. Besides this, she also started selling ready made garments from which she made a profit of Rs. 2000-3000 per week.

As her income and confidence grew, she took another loan from SHG (after repaying the earlier loan) to purchase a cross-bred cow. Other investments included a site purchased for Rs.30,000, with a loan of Rs.20,000 from the SHG and Rs.10,000 from the Bank. Assets at home also increased – they purchased TV, fan, refrigerator, etc. Her son, who was earlier attending Government school, was shifted to a private school for better education.

Case 2:

Venkatamma's family in Aralakunte village

Venkatamma and her husband Venkataraman own 2 acres of dry land. With support from the project, they put bunds on their land. They also planted forestry species on the outer bunds. They invested around Rs.3000 to 4000 (including their own contribution) for this work. They grow ragi, intercropped with lab-lab and jowar in their land. For the past 10 to 15 years they have been using Indaf Ragi (high yielding hybrid variety). Before bunding work was undertaken, this variety yielded 12-15 bags of ragi per acre, but after treatment, the same variety started yielding 15 to 17 bags per acre. The entire produce is used for consumption to support a family of 6 members.

Apart from land treatment, the couple have benefited from membership in the SHG and the Area Group. Venkataraman took a loan of Rs.10,000 from his AG and by investing another Rs.10,000 from his savings purchased a bullock. Earlier he owned one bullock, but with the purchase of another, he now has a pair which he uses for ploughing. Besides using it to plough his own land, Venkataraman started renting out the pair of bullocks to other farmers. He charges Rs.350 per acre per day for ploughing; during the agriculture season he earns between Rs.10,000 to 14,000.

Venkatamma purchased a sheep in 2006 by taking a loan of Rs.2,000 from her SHG. In the past 3 years she multiplied her stock and sold 4 sheep for Rs.9,000. At present she has 3 sheep, which according to her might fetch another Rs.7,000 to 8,000. Similarly Venkataraman also has earned Rs.6,000 to 7,000 from goat rearing activity that he started after taking a loan from his AG.

Today the couple is recognized in their village for their hard work and entrepreneurial skills. The couple in turn attributes their development to the trainings that they received during Sujala. The couple has 4 children, all of whom are studying in government school. Venkataraman says, "All our hard work is for the sake of our children. We want to educate them and give them a better life".

Case 3:

AK Shivappa of Padigatti village

Shivappa and his wife are members of CBOs – Shivappa is a member of an AG and his wife of a SHG. Both have realized the benefit of being in groups. They own 4 acres of dry land where they grow ragi and maize combined with other crops like gingili, groundnut, urali, etc. As their land was full of boulders, they could not realize good yield.

Before Sujala project came to their village, the couple went to work at a brick kiln in a nearby village during the non-agriculture season. They had health problems because of the pollution at the kiln. When Sujala programme came to Padigatta, both of them

became members in CBOs. They got their land treated, boulders removed and bunding done. Within two years they could make out the difference in yields. When their land was filled with boulders, they used to get only 3 bags of ragi per acre, but after land treatment works like boulder removal and bunding, the yield increased to 8 bags. This was a significant achievement and was a great support for sustaining the family of six. Shivappa adds, "In dry land agriculture a lot depends on timely rainfall. Last year also I was expecting a good yield, but due to heavy rainfall I could harvest only 6 bags of maize, losing on additional 6 bags. Agriculture is uncertain".

The couple has also grown 100 teak plants and 30 mango plants on their land with project support. Both have taken loans from their respective groups for income generation activities. After the project the family has stopped going to the brink kiln. Instead in the non-agriculture season, they go for agriculture labour in the neighbouring villages. They say, "Even if we get less wages as agriculture labour as compared to the kiln work, it gets compensated with increased yield in our land and we do not have health problems".

Case 4:

Sidaramappa of Padigatti village

Sidramappa owns 2 acre 10 guntas of land in Padigatti. Apart from crops like ragi, maize and groundnut, he has coconut and areca nut trees. Due to continuous erosion, his land had developed deep gullies. Because of this, his crops suffered. With the support of Sujala he got 2 waste weirs constructed in his land. He also got bunding done. This helped to retain the soil and water on his land. Gradually he saw that his yield increased almost 1 ½ times.

Sidramappa has a bore well. It had been yielding 2" of water over the past 15 years. After 5 Nala bunds were constructed, the yield of the well increased and he found that he could irrigate a larger area. Hence 1½ years back, he converted all his land into plantation and took an additional 2 acres dry land from his brother on lease. Here he started growing crops like ragi and jowar. His brother's land was also treated under Sujala and started getting better yield than before (4 to 5 bags of ragi/ acre as compared to 2 to 3 bags/ acre).

For converting his agriculture land into plantation and for taking his brothers land on lease, Sidramappa took a loan of Rs.10,000 from his group. He repaid this loan within a year.

1.6 NABARD Cluster Development Programme - Chitradurga

Observations about the NABARD Cluster Development Programme, Chitradurga

The purpose of visiting this project was to observe its implementation and compare it with MYRADA's other watershed programmes. As the project is only two years into implementation, not enough time has passed to see any visible result/impact.

Introduction

The NABARD programme called Sarvangina Vikasana Yojane is a cluster development approach to bring about overall development of families living below the poverty line in backward districts and areas. Selected development activities are implemented in a comprehensive manner in a selected geographical cluster.

In Chitradurga district, Myrada has taken up the role of implementing agency. Since the Vedavathi river flows across this cluster of villages, the project was called Veda Sarvangeena Vikasana Yojane. NABARD in 2006-07 suggested that Myrada take a fresh look at various approaches to development and adopt a new strategy to reach the poorest. Chitradurga was identified by the Government of Karnataka as one of the distress districts. Myrada has a strong field presence here. Hence this district was chosen to pilot this approach.

Criteria for deciding the economic category

1. Poor: Above 1 to 3 hectares of dry land but located at ridge point, bullocks, milking cow and 1 to 5 sheep/goat, own house kadapa but do not have proper toilet facility, also goes as labour, (some people have around ½ acre irrigated land but not have other bullocks)

2. Poorest: dry dandholding of one hectare or less, own hut/ kadapa/Janatha house, minimum livestock (mainly sheep/goat/chicks and local cow) go for labour, cultivating on lease land, more number of children

3. Vulnerable Families: Landless, Labourers, no hut or bad quality house, no livestock, living with others, widows/nomads/beggars, distress migrants, no motivation for development

Based on secondary data that established high levels of poverty and which was later reconfirmed through primary surveys, **10 contiguous villages of Haligondanahalli cluster in Challakere taluk** were selected for the project. A team from Myrada conducted participatory exercises and discussions in the area and classified the households in the cluster into 6 broad categories ranging from the comfortably-off to vulnerable. The last 3 categories were designated as Poor, Poorest and Vulnerable. Together,

the number of households that came in these categories numbered 2,092, representing approximately 72% of the total household in the cluster (Poor: 918 families; Poorest: 616 families, Vulnerable: 466 families). A comprehensive Plan was submitted to NABARD for the development of these 2000 families

A sum of Rs. 75,000 was provided by NABARD for the preliminary exercise of identifying the project beneficiaries and developing a proposal to be placed before it. This indicated NABARD's strategy to make a right beginning by allotting a specific budget and time for pre-project activities.

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Criteria for selection of Haligondanahalli cluster for the project:

- Poverty status: As per secondary data, 69% of families are living below the poverty line, which is higher than the district average i.e. 40%.
- Percentage of dry land: The area has more than 70% of the dry land (of the total 6450 hectares of cultivable land) though it is recorded that it has 11% irrigated land, 54% (of 570 hectare) of this irrigated land has not received water from Ranikere tank since four years due to severe drought conditions. Deputy Commissioner has ordered not to release the water for irrigation, as it is needed for cattle and domestic purposes.
- Number of marginal and small farmers: 71% of the farmers have land holding of ¼ hectare to 3 hectares of dry land.
- Literacy level: Though the literacy rate of Chitradurga district is 64.88% (2001), the cluster literacy rate is 42%.
- SC/ST category: 48% of the total families come under SC/ST category which is higher than the District average of 39%
- Border area: These Villages are located in the border of five Grama panchayath which are located near the border of Andhra State.
- Status of Natural Resources not addressed: Though the natural resources of the area have degenerated severely, no watershed programme has been implemented so far.
- Working experience: MYRADA has working experience in the area and has developed good rapport with the communities.
- Organised Community: Around 90 SAGs are functioning in the cluster area. Two Federations of the SAGs and Two Community Managed Resource Centres are functioning in the area.

List of families was selected thorough PRA methods. This list was ratified in Grama Sabhas to ensure transparency and to eliminate any wrong categorization. Selection procedures and criteria were documented.

Objectives

Overall, the project aims to "create sustainable livelihoods for 2000 families through regeneration of natural resources, farm development and creation of off-farm employment opportunities"

More specifically the objectives were:

- To increase the incomes of the target families through Integrated farm development activities
- To inculcate good farming practices among farmers
- To increase the incomes of poor families through skills promotion and IGAs
- To reduce the reproductive health problems of women
- To create enabling & stress free working/ living environment for women
- To improve the infrastructure of the cluster communities to complement the development process through increased production and marketing
- To promote institutional platforms for participatory implementation of the project and management of community infrastructures.
- To enhance soil and water on common lands
- To increase the biomass of the area
- To increase the fodder in the area

Components

After thorough discussions with the families it was decided to include the following components in the project:

1. **Direct Assistance to Individual Families through livelihoods promotion activities:** This component included -
   a) **Economic advancement through farm development:** Soil and water conservation measures on individual lands, support for horticulture with protected irrigation and livestock promotion.
   b) **Economic advancement through the development of non-farm income generation programmes:** Financial support for various income generating activities to increase the incomes of the landless and marginal farmers.

c) **Programmes addressing gender and health issues:** Provision for kitchen equipment (fuel efficient stoves/cookers), construction of toilet/bath rooms, kitchen garden programme, etc. were proposed to reduce the drudgery/health problems of women.

2. **Community Development and promotion of Institutional platforms:** Common infrastructure to support income generation and livestock related activities, inputs for agriculture demonstration, solar street lights, health camps for animals and human beings, Entrpreneurship Awareness and Development Programmes (EAP, EDP), Training of Trainers (TOT) for Community Resource Persons on Reproductive and Child Health and good agriculture practices and several other training in soft skills for the members of SHG, book writers and federations were proposed.
3. **Soil and water conservation on common land for regeneration of natural resources:** Soil and water conservation measures, drainage line treatments, agro forestry, desilting and deepening of cattle ponds, fodder promotion, roof rain water harvesting, etc were proposed

Strategy

The project adopted the following strategy which had six components:

1. Focus on identified target groups who are poor and poorest.
2. Integrated and multiple interventions through farm development, skills promotions and enabling social environment to augment the economic and social advancement.
3. Community Development and Promotion of institutional platforms to support cooperative actions for participatory project implementation
4. Transfer of knowledge / information and hand holding support to translate the learning into actions
5. Measures to enhance water and soil on both individual and common lands and regeneration of natural resources
6. Credit linkage from financial institutions to ensure sustained financial support

How this project differs from other Myrada projects

Though watershed activities are a part of the project, it is different from MYRADA's other watershed programmes in the following ways:

a. The ridge to valley concept including the strategy of treating all lands in a catchment which was adopted in other projects was not followed here. Only the lands of the poor are selected for treatment
b. The selected families were assisted directly for not only land treatment but also to take up activities such as livestock, horticulture promotion; this component was included in Sujala but not in EZE and GAA supported watershed programs.

c. The livelihood needs of landless families are addressed through non-farm skills training and financial support.

The focus here is not so much on the watershed but on the families. The objective is to ensure that targeted beneficiaries reap maximum benefits from the project.

Implementation

A total of Rs. 669.6 lakhs was proposed to be invested in this project over a period of 4 years. Of this, 72% is a grant from NABARD and remaining 28% is to be mobilised through banks/SAGs.

A committee called Vedavati Committee was formed at the cluster level to oversee the entire project implementation. This was registered in Feb.2007. Each village has one federation responsible for implementing works in the villages. Representatives from these federations form the Vedavati Committee.

For the Direct Assistance programme a basket of options was prepared for the three categories after discussions with the community. Within a specified budget, families can choose the activities according to their preference. The unit cost for the 'poor' families was Rs.14,000, for 'poorest' Rs.14,360 and for the 'vulnerable' Rs.16,000. Rate of contribution varies from one category to another – for 'poor' it is 60%, for 'poorest' it is 50% and for vulnerable it is 40%. For common land works and for community development programme, the community contribution is 10%.

All activities are implemented through SAGs and SHG federations with the active involvement of Gram Panchayats. Micro-plans are prepared for each family after thorough discussions in the SHG; funds are also routed through the SHG for individual/ family activities and through SHG federations for common land activities.

Observations

- All activities are being implemented through the existing network of SAGs and their Federations. There is a high level of interest and participation among group members visited during the study.
- As contribution is high, there is higher degree of involvement of the families. The community feels responsible for this project.
- Skill trainings are organised through SAGs and there is strict monitoring by the SAGs with regards to utilization of the training.
- Since members need to make a contribution towards each of the activities and the contribution needs to be made to the SHG before the activity can be started, many beneficiaries end up borrowing from the SHG to pay the contribution. The effective

contribution percentage therefore goes up as the member also pays an interest on the loan. For the last category this can be a burden.

- In KG Halli village, the SHG federation has implemented common land activities such as construction of drinking water troughs for cattle, bore well recharge pits and threshing yard costing Rs. 2 lakh. Since the project guidelines mandate 10% community contribution for common land treatment, the ten SAGs in the village have paid around Rs. 18000 from their funds to meet this requirement. The remaining Rs.2000 was paid in the form of labour by a few men in the village. The SAGs of the poor have in effect subsidized the community activity.

Annexures for Part I ....

Annexure 1a:

Data Format for WDA/ AG/ Committee interactions

Basic Information about village and AG

Village: _____ No. of HH. _____

MMC Name _____Micro Watershed: _____

Sub-watershed _____

AG name: _____ Functionality: Yes/ No Started:_____

No. of members: Before _____ Now _____

No. of S & M farmers: _____ No. of Big farmers: _____

No. of farmers with irrigation facility: _____

Financial Linkage: _____ Amount: _____

Linkage with Fed./ CMRC:_____

Area of MMC: _____

Dry Land: _____ Irrigated Land: _____

Fallow land: _____

Private land:_____Common Land: _____

No. of farmers who treated their lands:_____

Collect details pertaining to activities carried out: Activities – Extent (Ha./ Nos./Rmt/…) – Expenditure (Project + Contribution) ----------

Guideline for Interaction

Sr. No.	Before	After
1.	Change in migration (or going for cooli work outside their village) – no. of families	
2.	Soil water retention	
3.	Crop diversification (what crops, what variety, what fertilizers)	
4.	Increased productivity (crop wise)	
5.	Horticulture crops (new varieties introduced – area increased)	
6.	Export of agriculture produce (Sending outside village)	
7.	Increased area under cultivation agri land + fallow land)	
8.	Sources of irrigation (change in nos.)	

9.	Increased area under irrigation	
10.	Increased vegetation (plantation done No. & in Ha.). Bund plant. – kgs of seed sown	
11.	Livestock variety and population	
12.	Availability of fodder and fuel wood	
13.	Ground water table	
14.	Drinking water availability	
15.	Increased income (or sources of income??)	
16.	Changed living conditions (eg: constr/ repair of house; purchase of assets, education)	
17.	Introduction of new technologies	

Other issues:

- Involvement of AG/ WDA/ EC in the process of project implementation
- Activities of AG/ WDA/ EC at present
- Their contribution to community

Annexure 1b: Change in cropping pattern

A) Change in Cropping Pattern in Hirehalla Sub-watershed, Chitradurga

Micro - watersheds	Consumption crops		Commercial crops	
	Crops grown earlier	Crops grown at present	Crops grown earlier	Crops grown at present
Apparasanahalli	Sesame, Jowar	Ragi & Jowar	Maize, coconut	Maize, Areca
Channapattna	Ragi, sesame & Jowar	Ragi, Vegetables & Jowar	Maize	Maize, Areca & Cotton
Arasanagatta	Jowar	Jowar & Vegetables	Areca	Areca & Sunflower
Chikkandavadi-1	Ragi &Jowar	Ragi &Jowar	Maize Areca	Maize ,Areca & Sunflower
Chikkandavadi-2	Ragi &Jowar	Ragi &Jowar	Maize Areca	Maize ,Areca & Sunflower
Banagere	Sesame,Ragi & Jowar	Sesame,Ragi & Jowar	Maize & Sunflower	Maize, Sunflower & Mango
Gundimadu	Ragi & Hesaru Jowar	Ragi, sesame, Vegetables & Jowar	Jowar, Ground-nut	Maize , Cotton & Sunfolwer
Kunagali (gajanana)	Ragi,sesame & Hesaru Jowar	Ragi, sesame, Vegetables & Jowar	Jowar, Ground-nut	Maize & Cotton
Shivapura	Ragi,sesame & Jowar	Ragi,sesame & Jowar	Maize & Areca	Maize, Sunflower & Areca
Abradasikatte	Sesame & Jowar	Ragi, Vegetables & Jowar	Maize	Maize, Mango & Cotton
Chikkanakatte	Ragi, Jowar	Ragi, sesame, Vegetables & Jowar	Maize	Maize & Mango
Hosahalli-1	Ragi,sesame & Green gram, Jowar	Ragi, sesame, Vegetables & Jowar	Maize & Areca	Maize,Areca & Mango
Hosahalli-2	Ragi & Jowar	Ragi & Jowar	Maize & Mango	Maize, Mango, Sunflower & Cotton
Agrahara	Ragi, sesame & Jowar	Ragi, sesame, Vegetables & Jowar	Maize	Maize & Ground nut
Maddenahatti	Jowar & Vegetables	Ragi, sesame, Vegetables & Jowar	Maize & Areca	Maize, Areca & Cotton

B) Change in Cropping Pattern in Gangasamudra Sub-watershed, Chitradurga

Micro - watersheds	Consumption crops		Commercial crops	
	Crops grown earlier	Crops grown at present	Crops grown earlier	Crops grown at present
Gollarahalli	Ragi , jowar	Ragi, jowar & Vegetables	Maize & sesame	Banana, Maize & Groundnut
Hosahatti	Ragi, jowar	Ragi, jowar & Vegetables	Maize & Areca	Maize, Areca, Onion & Hurali
Ganagasam_ udra-I	Ragi, jowar	Ragi, jowar & Vegetables	Maize, Sunflowar	Maize, Areca, Onion &
Ganagasam_ udra-2	Ragi, jowar	Ragi, jowar & Vegetables	Maize, Sunflowar	Maize, Areca, Onion
Arabagatta	Ragi, jowar & Vegetables	Ragi, jowar & Vegetables	Maize & Areca	Maize, Ground nut & Hurali
Bidarkere	Ragi, jowar & Vegetables	Ragi, jowar & Vegetables	Maize & Areca	Maize, Ground nut & Hurali
Muddapura	Ragi, jowar	Ragi, jowar & Vegetables	Sesame & Ground nut	Maize, Ground nut & Sunflowar
Jakkanahalli	Ragi, sesame & jowar	Ragi, jowar & Vegetables	Ground nut, Areca, flowers,	Cocumber, Ground nut, Areca & Flowers

C) Change in Cropping Pattern in Palar River Left Bank Sub-watershed, Kolar

Micro - watersheds	Consumption crops		Commercial crops	
	Crops grown earlier	Crops grown at present	Crops grown earlier	Crops grown at present
Madderi mallanadahalli MC	Ragi, Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Veerapura MC	Ragi, Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango

Ankkathatte MC	Ragi, Horse gram, Jowar,Toor dal,	Ragi, Horse gram, Jowar,Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango
Chittanahalli MC	Ragi,Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Kamadenu MC	Ragi,Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Bhuvaneswari MC	Ragi,Horse gram,Jowar, Toor dal,	Ragi, Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Amarajoythi MC	Ragi,Horse gram,Jowar, Toor dal,	Ragi,Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Thurandahalli MC	Ragi,Horse gram,Jowar, Toor dal,	Ragi,Horse gram, Jowar, Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango
Muduvadi Hosahalli MC	Ragi,Horse gram,Jowar, Toor dal,	Ragi,Horse gram, Jowar, Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango
Nayakarahalli MC	Ragi,Horse gram,Jowar, Toor dal,	Ragi,Horse gram, Jowar, Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango

D) Change of Cropping Pattern in Palar River Right Bank Sub-watershed, Kolar

Micro - watersheds	Consumption crops		Commercial crops	
	Crops grown earlier	Crops grown at present	Crops grown earlier	Crops grown at present
Thambihalli	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Belaganahalli	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango
Holali	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango
Ramasandra	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Doddanahalli	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Tippasandra	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Aralakunte	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Vegetables, Mulberry, Papaya, Mango	Vegetables, Mulberry, Papaya, Mango
Vadaguru	Ragi,Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar,Toor dal,	Eucalyptus Vegetables, Mango	Vegetables, Mulberry, Papaya, Mango

E) Change of Cropping Pattern in Mustrahalla Sub-watershed, Kolar

Micro - watersheds	Consumption crops		Commercial crops	
	Crops grown earlier	Crops grown at present	Crops grown earlier	Crops grown at present
Lakkenahalli	Ragi, Horse gram, Jowar,Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Janugutte	Ragi, Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Bodagurki	Ragi,Horse gram, owar, Toor dal,	Ragi,Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Guttur	Ragi,Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Arimanahalli	Ragi, Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Doddakalavanchi	Ragi,Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Thanimadugu	Ragi, Horse gram, Jowar,Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Buvanahalli	Ragi, Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Sakarasanahalli	Ragi, Horse gram, Jowar, Toor dal,	Ragi, Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango
Bathalahalli	Ragi, Horse gram, Jowar, Toor dal,	Ragi,Horse gram, Jowar, Toor dal,	Vegetables, Mulberry, mango	Vegetables, Mulberry, Mango

Annexure 1c: Change in Productivity

A) Change in Productivity in Gangasamudra watershed in Chitradurga

Change in productivity - only for major crops (both commercial and consumption) – in Quintal/ acre			
Micro-watershed	**Name of crop**	**Before**	**After**
Gollarahalli	Maize	15	18
	Ragi	8	10
	Sunflower	5	7
	Jowar	7	9
Hosahatti	Maize	14	17
	Sesame	6	8
	Sunflower	5	7
Ganagasamudra-1	Maize	14	17
	Ragi	8	10
	Sunflower	5	7
	Jowar	7	9
Ganagasamudra-2	Jowar	8	10
	Ragi	7	10
	Sunflower	5	7
	Maize	15	18
Arabagatta	Maize	12	14
	Ragi	8	10
	Sunflower	5	7
	Jowar	8	10
Bidarkere	Maize	15	18
	Ragi	8	10
	Sunflower	6	8
	Jowar	7	9
Muddapura	Maize	14	17
	Ragi	8	10
	Sunflower	7	8
	Jowar	8	10
Jakkanahalli	Maize	15	17
	Ragi	8	9
	Sunflower	6	8
	Jowar	8	9

B) Change in Productivity in Hirehalla watershed in Chitradurga

Change in productivity - only for major crops (both commercial and consumption) – in Quintal/ acre			
Micro-watershed	**Name of crop**	**Before**	**After**
Apparasanahalli	Ragi	6	10
	Maize	14	16
	Sunflower	4	6
Channapattna	Ragi	6	8
	Maize	14	18
	Sunflower	4	6
	Jawar	8	9
Arasanagatta	Areca nut	10	12
	Maize	14	16
	Sunflower	4	6
Chikkandavadi-1	Ragi	7	10
	Maize	14	17
	Sunflower	4	6
	Sesame	4	5
Chikkandavadi-2	Ragi	7	10
	Maize	14	17
	Sunflower	4	6
	Sesame	4	5
Banagere	Ragi	6	8
	Maize	15	18
	Sunflower	4	6
	Jowar	10	13
Gudimadu	Maize	15	18
	Ground Nut	3	5

	Sunflower	4	5 to 6
	Ragi	7	10
Kunagali	Ragi	6	10
	Maize	15	18
	Sunflower	4	6
Shivapura	Ragi	7	9
	Maize	14	18
	Sunflower	4	6
Abradasikatte	Maize	14	16
	Ground Nut	3	5
	Sunflower	4	5 to 6
	Ragi	7	10
Chikkanakatte	Maize	15	16
	Ground Nut	3	5
	Sunflower	4	5 to 6
	Sesame	3	3.5
Hosahalli-1	Maize	15	18
	Areca Nut	10	11
	Sunflower	4	5 to 6
	Sesame	3	3.5
Hosahalli-2	Ragi	8	10
	Maize	14	17
	Sunflower	4	7
Agrahara	Maize	15	18
	Jowar	7	9
	Sunflower	4	5 to 6
	Sesame	3	3.5

C) Change in Productivity in Palar River Left Bank watershed in Kolar

Change in productivity - only for major crops (both commercial and consumption) – in Quintal/ acre			
Micro-watershed	**Name of crop**	**Before**	**After**
Madderi mallanadahalli MC	Mango	55	141.11
	Vegetables	38	72
	Mulberry	38	88
Veerapura MC	Mango	45	50.3
	Vegetables	20	22
	Mulberry	38	61
Ankkathatte MC	Mango	52	75
	Vegetables	48	64
	Mulberry	36	78
Chittanahalli MC	Mango	68	120
	Vegetables	28	46
	Mulberry	18	26
Kamadenu MC	Mango	122	165
	Vegetables	32	40
	Mulberry	30	45
Bhuvaneswari MC	Mango	55	80
	Vegetables	16	24
	Mulberry	8	16
Amarajoythi MC	Mango	78	95
	Vegetables	40	60
	Mulberry	22	48
	Papaya		13
	Grapes		9
Thurandahalli MC	Mango	78	109
	Vegetables	62	72
	Mulberry	28	46
Muduvadi Hosahalli MC	Mango	76	102
	Vegetables	42	58
	Mulberry	28	48
Nayakarahalli MC	Mango	16	20
	Vegetables	22	30
	Mulberry	18	28

Annexure 1d:
Biomass promoted in watersheds in Chitradurga and Kolar

A) Biomass promoted in Mustrahalla watershed, Kolar

Sr. No.	Name of micro-watershed	Forestry species promoted (including fodder and fuel wood species)			
		On bunds (in Rmt.)	Road side plantation (in km)	On common land (in Ha.)	On private land (in Ha.)
1	Lakkenahalli	20639		4.5	5.65
2	Janugutte	36604	1.5	4.4	106.2
3	Bodagurki	34001	4	3	53.47
4	Guttur	35224	3	5.3	42
5	Arimanahalli	30559	2		71.41
6	Doddakalavanchi	44613	1	13.4	56.37
7	Thanimadugu	27934	4.5	21.5	97.14
8	Buvanahalli	34730		3	57.9
9	Sakarasanahalli	43162	1.05	3.48	108.2
10	Bathalahalli	36913		2.5	115
	Total	**344379**	**17.05**	**61.08**	**713.34**

B) Biomass promoted in Palar River Left Bank Watershed, Kolar

Sr. No.	Name of micro-watershed	Forestry species promoted (including fodder and fuel wood species)			
		On bunds (in Rmt.)	Road side plantation (in km)	On common land (in Ha.)	On private land (in Ha.)
1	Madderi Mallanadahalli MC	18096	2	7.25	71.25
2	Veerapura MC	14800	0.5	12.55	70.52
3	Ankkathatte MC	55227	9	14.22	25.98
4	Chittanahalli MC	41919	11.7	9.5	146.35
5	Kamadenu MC	37734	0	15.32	95.31
6	Bhuvaneswari	42204	3.2	9.23	86.13
7	Amarajoythi MC	19153	4.8	1.2	64.1
8	Thurandahalli MC	37975	3.00	17.71	79.04
9	Muduvadi Hosahalli MC	6519	0	7.00	116.8
10	Nayakarahalli MC	24338	0.9	23.5	38.84
	TOTAL	**297965**	**35.1**	**117.48**	**794.32**

C) Biomass promoted in Palar River Right Bank Watershed, Kolar

Sr. No.	Name of micro-watershed	Forestry species promoted (including fodder and fuel wood species)			
		On bunds (in Rmt.)	Road side plantation (in km)	On common land (in Ha.)	On private land (in Ha.)
1	Thambihalli	10293		1	
2	Belaganahalli	36085	0.8	5.8	
3	Holali	38800	3	8.6	
4	Ramasandra	27384	4	12.7	
5	Doddanahalli	26676	4	2	
6	Tippasandra	45187		1.25	
7	Aralakunte	26424	4	2.5	
8	Vadaguru	38705	1	6	
	Total	**249554**	**16.8**	**39.85**	

D) Biomass promoted in Markandahalla Watershed, Kolar

Sr. No.	Name of micro-watershed	Forestry species promoted (including fodder and fuel wood species)			
		On bunds (in Rmt.)	Road side plantation (in km)	On common land (in Ha.)	On private land (in Ha.)
1	Ramapura	52525	5	10	82
2	Kadirenahalli	76565	2	7	62
3	Budikote	18448	2		80
4	Kondenahalli	27602		12	118
5	Alambadi	50318	3	2	162
6	Naganahalli	36916		8	74
7	Doddapura	79567		7	92
8	Upasapura	37714	4	2	128
9	Kottooru	30560	1	3	88
	Total	**410215**	**17**	**51**	**886**

E) Biomass promoted in Hirehalla Watershed, Chitradurga

Micro-watershed	Bund plantation (in Rmt.)	Roadside plantation (in km.)	Common land plantation (in Ha.)	Private land plantation (in Ha.)
Apparasanahalli	5720	0	1	15.77
Channapattna				
Arasanagatta	4520	10	20	23
Chikkandavadi-1	3570	0	19	18
Chikkandavadi-2	5645	2	14	6
Banagere	2564	3	12	23
Gundimadu	3520	0	14	20
Kunagali	4500	1	19	7
Shivapura	2350	0	8	19
Abradasikatte	2690	0	35.3	26.94
Chikkanakatte	4530	5	21	56
Hosahalli-1	6700	0	22	16
Hosahalli-2	5450	0	24	20
Agrahara	3250	0	15.88	22
Maddenahatti	6125	10	38	18
Total	61134	31	263.18	290.71

F) Biomass promoted in Gangasamudra Watershed, Chitradurga

Micro-watershed	Bund plantation (in Rmt.)	Roadside plantation (in km.)	Common land plantation (in Ha.)	Private land plantation (in Ha.)
Gollarahalli (rangnathswami)	2520	0	15	10
Hosahatti	1850	0	9.38	15
Ganagasamudra-1	2670	4	3.7	18.7
Ganagasamudra-2	2580	0	12	13
Arabagatta	4560	0	3	4
Bidarkere	3670	6	12	9
Muddapura	3250	0	6.5	12
Jakkanahalli	4250	10	1	14.41
Total	25350	20	62.58	96.11

Annexure 1e:
Horticulture promoted in watersheds in Chitradurga and Kolar

A) Horticulture promoted in Chitradurga

Hirehalla sub-watershed				Gangasamudra watershed			
Micro-watershed	**Species**	**Area (in Ha.)**	**Nos.**	**Micro-watershed**	**Species**	**Area (in Ha.)**	**Nos.**
Apparasan-ahalli	Mango	32	3396	Gollarahalli (Rangnath-swami)	Mango & Sapoto	66	9539
Channapattna	Mango			Hosahatti	Mango	21.17	3025
Arasanagatta	Mango & Sapoto	42	4976	Ganagas-amudra-1	Mango	13	1968
Chikkandav-adi- 1	Mango	34	4295	Ganagasa-mudra-2	Mango & Pomogr-anate	6.7	925
Chikkanda-vadi- 2	Mango	8	925	Arabagatta	Mango & Sapoto	31	4437
Banagere	Mango & Sapoto	86	11170	Bidarkere	Mango & Pomogra-nate	74	10632
Gundimadu	Mango & Pomog-ranate	76	8060	Mudda-pura	Mango, Sapota & Pomogra-nate	21	3440
Kunagali	Mango	94	9912	Jakkana-halli	Mango, Sapota & Pomogra-nate	11	1596
Shivapura	Mango	69	8170		**Total**	**243.87**	**35562**
Abrada-sikatte	Mango & Badami	49	5906				
Chikka-nakatte	Mango	46	5564				
Hosahalli-1	Mango	62	6459				
Hosahalli-2	Mango	107	11775				
Agrahara	Mango	66	7185				
Maddena-hatti	Mango & Sapoto	118	14173				
	Total	**889**	**101966**				

B) Horticulture promoted in Kolar …

Hirehalla sub-watershed				Gangasamudra watershed			
Micro-watershed	**Species**	**Area (in Ha.)**	**Nos.**	**Micro-watershed**	**Species**	**Area (in Ha.)**	**Nos.**
Madderi Mallanad-ahalli MC	Mango, Sapota, Cashe-wnut	57.11	4899	Thambi-halli	Mango, Sapota	37.69	800
Veerapura MC	Mango, Sapota, Cashe-wnut	20.35	2035	Belagana-halli	Mango, Sapota, Cashw-enut	63.32	5000
Ankkathatte MC	Mango Sapota Cashe-wnut	30.3	3055	Holali	Mango, Sapota	69	5000
Chittanahalli MC	Mango, Sapota, Coco-nut	48.49	4947	Ramasa-ndra	Mango, Sapota	58.5	4039
Kamadenu MC	Mango, Sapota, Cashe-wnut, Guava	66.7	6758	Doddana-halli	Mango, Sapota	45.81	4061
Bhuvanes-wari MC	Mango, Sapota, Cashe-wnut	32.43	3276	Tippasan-dra	Mango, Sapota	26.72	2113
Amarajoythi MC	Mango	38.77	2469	Aralaku-nte	Mango, Sapota	49.52	4864
Thuranda-halli MC	Mango, Sapota, Jack fruit, Cashe-wnut	44.07	4229	Vadaguru	Mango, Sapota,	36.35	2542
Muduvadi Hosahalli MC	Mango	40.94	**4094**	**Total**		**386.91**	**28419**
Nayakara-halli MC	Mango, Sapota, Coco-nut	7.83	783				
Total		**386.99**	**36545**				

Horticulture promoted in Kolar

Hirehalla sub-watershed				Gangasamudra watershed			
Micro-watershed	**Species**	**Area (in Ha.)**	**Nos.**	**Micro-watershed**	**Species**	**Area (in Ha.)**	**Nos.**
Lakkena-halli	Mango, Sapota, Pomogranate	7.9	790	Rama-pura	Mango Sapota Cashe-wnut	23	2300
Janugutte	Mango, Sapota, Pomogranate	15.4	1540	Kadirena-halli		11	1100
Bodagurki	Mango, Sapota, Pomogranate	17.35	1735	Budikote		17	1700
Guttur	Mango, Sapota, Pomogranate	19	1900	Kondena-halli		37.2	3720
Arimana-halli	Mango, Sapota, Pomogranate	23.6	2360	Alambadi		1285	1285
Doddaka-lavanchi	Mango, Sapota, Pomogranate	32.65	3265	Nagana-halli		10.1	1001
Thanima-dugu	Mango, Sapota, Pomogranate	29.84	2984	Dodda-pura		18.65	1865
Buvana-halli	Mango, Sapota, Pomogranate	21.63	2163	Upasa-pura		13.55	1355
Sakara sana-halli	Mango, Sapota, Pomogranate	38	3800	Kottooru		11.2	1120
Bathala-halli	Mango, Sapota, Pomogranate	20	2000		Total	1426.7	15446
	Total	**225.37**	**22537**				

PART II

Evaluation of LEISA Programme and Organic Farming activities

PART II -

Evaluation of LEISA[6] Programme and Organic Farming activities

2.1 Process and Methodology

The evaluators interacted with staff of Myrad Krishi Vigyan Kendra (MKVK) Talavadi and the Myrada Kaveri Pradeshika Samsthe (MYKAPS) Project in H.D. Kote, Mysore District. They also conducted individual interviews, focus group and informal discussions as reported below:

MYKAPS HD Kote	MKVK Talavadi
Interviews with Farmers practising organic farming/LEISA farming practices (10 farmers)	Interviews with Farmers practising organic farming/LEISA farming practices (24 farmers)
Informal discussions with fertilizer shops (3 shops)	Informal discussions with fertilizer shops (3 shops)
	Discussions with Organic Farmers' Self Help Group – 1 group
	Discussions with Committee members of Janma Bhoomi CMRC including Directors of Kabini Organics Producers' Group

The format used for interviews is attached as Annexure 2a. A list of the farmers interviewed is attached as Annexure 2b.

2.2 Introduction to the Projects visited

MYKAPS H.D. Kote, Mysore District, Karnataka

Myrada has been working in H.D. Kote taluk in Mysore district since the 1970s. It has implemented many projects related to health, education, livelihood promotion, watershed

6 Low External Inputs Sustainable Agriculture

development, agriculture, animal husbandry, drinking water, sanitation etc. Most importantly it has promoted community based organisations such as SAGs (and federations of 10-15 SAGs), Watershed Development Associations (WDAs) and Community Managed Resource Centres (CMRCs) covering 100-150 CBOs and one Rural Technical Resource Centre providing skills training related to sanitation, rainwater harvesting systems and housing. In 2006, in line with Myrada's decentralization strategy, the H.D. Kote Project was registered as an independent organisation called the Myrada Kaveri Pradeshika Samsthe (MYKAPS). Myrada's Board agreed to lend its name to the new organization since it shared its mission. All staff of Myrada (who were working in H.D Kote project) joined the newly formed organization with William D'Souza as Executive Director.

As in other agriculture communities in India, rising costs of inputs, difficulty to obtain them in time and fluctuating prices of agricultural commodities had made agriculture a high risk activity for farmers in HD Kote. They also realized that continuous use of chemicals had depleted the soil and reduced productivity. A majority of the 24 farmers interviewed in HD Kote cited rising costs of chemical inputs, declining yields (especially in cotton) resulting in indebtedness and training programmes by Myrada as the major factors motivating them to shift from chemical to organic agriculture.

Myrada's engagement with farmers through its watershed interventions had enhanced their awareness of the situation. Farmers in WDAs had already received some measure of exposure to alternative practices such as natural farming, Zero Budget farming, etc. through training and exposure visits.

MYKAPS shares its parent organisation's mission of promoting agriculture as a viable and sustainable enterprise – one that will provide livelihood to farmers without compromising on the health of people or of the environment. It decided to work towards bringing about a change in farmers' dependency on external inputs by promoting locally available and sustainable inputs.

MYKAPS' foray into organic farming has been primarily through two local institutions, viz. the Savayava Krushakara Sangha (SKS) and the Kabini Organics Primary Producers' Company (KOPPC). The evaluation was restricted to these two organisations. All the farmers who the evaluators interviewed are members of either SKS or KOPPC.

The two institutions are managed separately and have their own structure and functions. While SKS has staff on deputation from MYKAPS, KOPPC which was initially managed as a project of MYKAPS, was registered as a Producers' Company in May 2010.

Besides promoting organic cotton which is purchased by Appachi Cotton, MYKAPS also works with farmers who cultivate organic spices, such as turmeric and coriander. A partnership is in place with ITC for technical inputs and buy-back arrangements of these spices through the latter's project called Mission Sunehra Kal.

Savayava Krushakara Sangha (SKS)

The Kakanakote Savayava Krushakara Sangha (KSKS) was an earlier association formed in 2005 in HD Kote comprising prominent organic farmers of the taluk such as Vivek and Julie Cariyappa and Ramesh Kikkeri. However due to internal conflicts the organisation did not survive. According to Anand L., staff member of MYKAPS (on deputation to SKS as its Executive Secretary), getting together a group of organic farmers is not an easy task, as they all have different ideologies and practise different forms of organic farming; they are not flexible enough to accommodate the views of others. However members of Watershed Development Associations promoted by MYKAPS approached MYKAPS with a request to revive the association. They had been trained in Integrated Pest Management (IPM) in cotton crop through Farmers' Field School (FFS) conducted by Myrada and were convinced of the usefulness of the organic approach. Accordingly, MYKAPS facilitated the formation of another organisation, the Savayava Krushakara Sangha (SKS) which had WDA farmers and Vivek and Julie Cariyappa among others as members. In 2007 it was registered as an independent society.

SKS has very strict membership eligibility criteria to ensure that its members maintain complete organic integrity. Please refer Annexure 2c for SKS' membership criteria

Internal Control Systems (ICS) are in place which have been prepared by MYKAPS under the guidance of Vivek and Julie Cariyappa, who have been farming organically for twenty years. The ICS lays down the objectives and strategies of organic farming. It sets the 'standard for organic farming practice which upholds the fundamental and sustainable interaction between human, soil, plant, animal, insect and microbial life on this Earth. … it will assure the quality of organic agriculture and the ability of the farmer to understand and implement its practice.'

By laying down a set of social and environmental ethical norms for organic farmers to follow, it commits them to an organic way of living. It sets norms for every aspect of agriculture right from treatment of seed to management of inputs, regulations for preparation and use of bio-inputs for all the particular crops grown in the area (such as cotton, sugar cane, paddy, vegetables, etc.), for storage and marketing, for prevention and management of contamination by chemicals from adjoining fields and gives guidelines for documentation. SKS members (as also members of Kabini Organics Producers' Company) are required to adhere to the ICS; these are also used for organic certification by the international certifying agency, IMO.

Following ICS norms, farmers maintain detailed documents including a daily record of all inputs used, works done, etc. Farm level documentation has been adopted wholly by farmers who report that it is very useful in helping them keep track of their expenses, yields, etc. Please refer Annexure 5d for a brief overview of the ICS parameters and details of documents maintained.

Objectives of SKS

The following are the objectives of SKS:

- To make Farming families self reliant in thinking, health and Agriculture inputs.
- To improve soil health.
- To improve health of human and animals.
- To conserve and use traditional seeds and protect biodiversity.
- To reduce water consumption in agriculture.
- To improve the air and water quality by tree planting.
- To make the village community self reliant, self sufficient and an economically viable part of Mother India.

Management of SKS

The organisation is administered by an Executive Committee to whom the Secretary reports. The present Secretary is deputed from MYKAPS. MYKAPS has also provided three full-time staff to SKS as well as office cum godown space with computer and internet facilities at its own premises. Besides support received from MYKAPS, SKS has also raised financial resources from private companies, government agriculture department and individuals. Farmers also pay some charges to it for services.

Functions

- SKS holds monthly meetings, which are for discussions on crop planning, certification, ICS, price fixing, market information, etc.
- It organizes training programmes for its members on organic farming practices and selects members for training programmes conducted by other agencies.
- It assists farmers in crop planning based on marketing and searches for prospective buyers, etc.
- It assists in internal inspections as per ICS norms and closely monitors dairies written by farmers. It has enlisted the support of IMO Control (Insitute for Market Ecology) – an international certification and inspection agency. It ensures regular internal and external inspections and sanctions are imposed against violations.
- A committee consisting of five persons decides on prices. The committee includes representatives of SKS, potential buyers and one local farmer with experience of local markets. It has established linkages with agencies such as Appachi Cotton for purchase of cotton, ITC for input support and buy back assurance for turmeric and chilly and Eco Agree, ISKCON Mysore, Elements Calicut, Era Organics Bangalore, Khandige Organic Health Products Bangalore for purchase of vegetables..

- It purchases commodities from farmers at retail rates, provides storage and arranges for buyers. It also purchases sugarcane from farmers for use in a jaggery-making unit that it operates.

Reach and Coverage of SKS

SKS currently has 127 members from 10 villages and covers 234 Ha. Members range from those who have gone completely organic to those who are in the conversion period[7]. 66 farmers are completely organic, 42 farmers are in the second year of in-conversion period and 14 are in the first year of in-conversion period. The start of the conversion period ranges from April 2004 to April 2009.

Kabini Organics Primary Producers' Company

Though cotton is grown in only 5% of arable area in India, it accounts for 35% of all pesticides used in the country. Since it is a cash crop, many small and marginal farmers also plant cotton, spending heavily on inputs that they often cannot afford. The project area in H.D. Kote is located in between two National Parks and food crops are vulnerable to attacks from wildlife. Hence most farmers, especially the poorer ones, prefer to cultivate cotton which is relatively free from wild life attack. The richer farmers can afford electrified fences to protect their crops. Cotton farming started in this area around 20 years ago. Initially yields were good, but many farmers in the area reported declining yields over the years due to continuous cropping. Increasing prices of chemical fertilisers and their unavailability at the right time and falling productivity had caused many farmers to stop/reduce using chemical fertilisers and pesticides. It is under such circumstances that MYKAPS started promoting the cultivation of organic cotton. Besides, H.D.Kote is one of the few areas in India that is suited to the cultivation of Extra Long Staple Cotton which has a good market in Europe.

The objective of the project is : '*To improve the Livelihoods of Small and Marginal cotton producing families in H.D.Kote Taluk and the Surrounding Regions through the Promotion of Organic and FLO (Fair Trade Labeling Organisation) Certified Cotton Production and Collective Marketing'*. The project is being implemented with the technical collaboration of a Bangalore based NGO named ETC and funded by a Dutch donor, the Rabo Bank Foundation.

The project aims to form a sustainable company comprising cotton farmers as the stakeholders. Appachi Cotton, a firm based at Pollachi in Tamil Nadu agreed to purchase organically grown cotton from the member farmers of Kabini Organics.

7 ICS defines conversion period as the phase of transition between the last harvest of a conventional crop and its products and the first planting of an organic crop, during which the said fields are said to be under organic management. A farm can be certified as organic only if it follows the ICS norms for 36 months. Internal inspections are carried out regularly to ensure that ICS parameters are being followed and there is no relapse to inorganic methods – if the relapse occurs the farmer will be treated as a defaulter and will have to start the conversion period from the start.

The target of the project is to involve 1500 farmers (in the first three years of the project) within a concentrated area and register them as a Primary Producer Company. The Company can then decide on bringing in more interested farmers.

Farmers who become members of the organisation are obliged to follow the Internal Control System (ICS) – strict adherence to which is absolutely necessary for obtaining and sustaining organic certification (Annexre 2d – ICS norms).

Management and Co-ordination

The Kabini Organics Project is now being managed by staff of MYKAPS with technical support from staff of ETC. The Programme Coordinator was formerly a staff of MYRADA and has been working in this area for 12 years. 14 members have been selected as the Directors of the organization.

The Steering Committee meets twice a year to take major management decisions. The staff of ETC and MYKPS co-ordinate the production, certification and marketing and related activities of the project. In order to ensure that activities are planned and implemented on time, the 31 villages in the project are divided into seven clusters each headed by a staff.

Progress

Implementation of the Kabini Organics Project started in 2008. As on September 2009, 626 farmers covering 1280 acres across 31 villages have been enrolled as members of the Company. Initial discussions were held with SAGs, WDAs and in the Gram Sabhas.

The following are the highlights of the implementation of the project in the first year:

- Procurement of untreated seeds: It was decided to sow the DCH-32 and Varalakshmi variety (ELS varieties) of cotton, but these were available only with the government department. However the department generally supplies seeds treated with chemicals, which is against the ICS norms. The project had to lobby with the government through the Organic Agriculture Cell at the Central Government level to obtain certified chemically untreated seeds. It was ultimately able to procure the seeds at subsidized rates from the Karnataka National Seeds Corporation and supply them to farmers
- Training of staff and farmers: Both staff and farmers underwent several rounds of training. On the technical aspects of organic cultivation through Farmers' Field Schools. They were trained in certification procedures, basic standards, ICS standards, documentation

as well as on the structure of the proposed Company, discussions on its bye-laws, rules and regulations, etc.

- Planting of Cassia siamea, Glyciridia and Pongamia saplings was taken up as block plantation, as well as on bunds to ensure availability of Farm Yard Manure (FYM).
- Organic methods of pest and nutrient management (such as treatment with Beejamrutha[8], use of organically and locally produced growth promoters) and pesticides such as vermicompost, Jeevamrutha[9], chilly garlic spray, neem oil spray, etc. were promoted.
- Water harvesting structures, farm ponds, waterways, were introduced (also through the NREGA programme[10]).
- Certification process: Based on the requirement of the buyer (Appachi Cotton), IMO Control has been selected as the certifying agency. Since most farmers are small and marginal, group certification has been applied for to reduce cost of certification. 626 enrolled farmers are in the Approved Farmers' List whose fields are visited at specific intervals by internal and external inspectors.
- Clean harvesting, grading, storage & marketing: This has been one of the biggest achievements of the members of Kabini Organics. They have now learned to clean the Cotton at the time of harvest and grade it; this gives them a better price. Cotton is graded from A to C with grade A fetching Rs.100 more per quintal than Grade B. Grade B fetches Rs.100 more per quintal than Grade C. Overall for A Grade Cotton Appachi Cotton pays the farmer 23% over the market price. Cleaned and graded cotton is stored in clean bags provided by the Company. These bags have not used for packing inorganic cotton or chemical fertilisers. The buyers weigh the cotton using electronic weighing machines which gives the farmers an additional 3kg cotton than the conventional weighing machine used by traders. All transactions take place in front of the farmer and receipts are issued immediately citing the weight and quantity. The Company purchases directly from the farmers who realize additional value because of grading and cleaning.

8 A product made out of cow urine, cow dung, natural lime and water to control soil borne diseases and to promote uniform and optimum germination

9 Jeevamrutha – a bio-growth promoter that is prepapred using locally available materials such as jaggery, cow urine and other herbs

10 NREGA – The National Rural Employment Guarantee Act is a programme of the Government of India to guarantee 100 days of unskilled wage employment in rural areas.

MYRADA KVK, Erode District, Tamil Nadu

Myrada has been working in Erode district in Tamil Nadu since the 1980s; it was called Periyar District then. It was actively involved in promoting high yielding local varieties of ragi, cross breeding on a large scale, organisation of milk societies, setting up a chilling plant, watershed management and formation of SAGs, WDAs, CMRCs and other CBOs

In 1992, a Krishi Vigyan Kendra[11] (KVK) was set up in partnership with Myrada by the Indian Council for Agriculture Research (ICAR). To ICAR's emphasis on technological interventions and productivity through spread of technology from lab to land, Myrada added its own emphasis on building peoples' institutions to promote participatory interventions, sustainability and equity. Both Myrada and ICAR value learning by doing and hence MKVK (Myrada KVK) has been engaged in adaptive research and extension.

Adaptive research is defined by Myrada as '*On-farm testing of technology that is technically proven, economically viable, socio-culturally acceptable and capable of being sustained by the farming community'. Myrada understands Extension as 'Interactive dissemination of field-proven practices and/or technology as well as promoting the development of institutions and systems that can lead to the adoption and assimilation of these technologies on a sustainable basis'.*

Myrada KVK's missions is to *"promote an integrated natural resource management and farming systems approach under complex, diverse, and risk prone conditions based on the principle of sustainable increase in productivity and equity through appropriate institutions and linkages that support ongoing changes in strategies, methods, and materials related to adaptive research and extension.* To this end its activities include:

- On farm testing
- Front line demonstration
- Training to farmers and rural youth (men and women) and extension functionaries
- Extension activities

According to, the Project Director of the Erode district MKVK, Dr Alagesan, its approach to LEISA is guided by Myrada's stand on organic farming – 'that of promoting low cost inputs while always ensuring that farmers' livelihoods are not compromised'. Besides, these technologies have to be acceptable and capable of being sustained by them. The MKVK divided farmers in Erode district into three categories: a) those using only organic inputs; (b) those using only chemical inputs and (c) those who use a mix of organic and inorganic inputs. It was Myrada's conscious decision to work with all three categories for the following reasons:

11 The Indian Council of Agricultural Research of the Government of India mandated the establishment of Krishi Vigyan Kendras as grassroots level Farm Science Centres designed to bridge the gap between available technologies at one end and their application for increased production at the other, with the object of bringing about sustainable integrated rural development, through a multi disciplinary approach

- To learn from the first category of farmers and document their practices
- To study the impact of the use of chemical fertilizers only and
- To promote judicious use and a balance of inorganic and organic inputs among the second and third category of farmers

Around the year 2000 MKVK started major extension programmes to promote LEISA with the aim of motivating farmers to eventually shift to an organic way of farming. In the initial years, this was largely limited to the promotion of *Panchagavya*[12] and vermicompost which was promoted actively. In 2003, with support from NOVIB, a Netherlands NGO, it began to organise extension activities in a more systematic manner. Following the new thrust, the programme was called 'Integrated Farm Development'. The catch phrases used were 'effective utilization of farm waste' or 'turning waste into wealth'. IFD helps small and marginal farmers reduce input cost by recycling various farm wastes and converting them into useful and productive components that can be used as alternatives to chemical inputs.

IFD was promoted as a basket of eleven practices:

1. Hygienic cowshed management with urine collection pit
2. Rain water harvesting
3. Eco-san toilets
4. Bio-gas
5. Fodder plot
6. Kitchen Garden
7. Grain storage bins
8. Biomass plantation on bunds
9. Vermicomposting,
10. Panchagavya (bio-growth promoter)
11. Bio-pest repellent

For a pictorial representation of an IFD model farm and description of the activities please see Annexure 2e.

Apart from the cultivation of cereals and pulses, Myrada/KVK also promoted cultivation of medicinal and aromatic plants (rosemary, citronella) and ELS cotton using LEISA practices.

12 An organic product made of five key ingredients which are products of the cow, viz. cow dung, cow urine, curds, milk and ghee. It also contains other ingredients such as jaggery, banana, toddy, etc. It helps increase the microbe population in the soil and promotes plant growth.

Farmers were motivated to adopt at least seven out of the eleven practices mentioned above while reducing their dependency on chemical inputs. ICAR now recognizes Myrada KVK as one of the few KVKs that promotes LEISA. At the 4th National Conference of KVKs jointly organized by the ICAR and the Tamil Nadu Agricultural University, Coimbatore in November 2009, Myrada KVK was given the **National Award for Best KVK** in the field of **Extension Education** for the year 2008-09.

There is a well-established network of people's institutions in place such as SAGs and CMRCs. The CMRCs are primarily responsible for providing agriculture services to their member organisations. MKVK is in the process of registering the Erode District Organic Farmers' Federation. Several meetings have been held in this regard and formalities for registration are underway.

MKVK assists farmers in organic certification and provides marketing linkages. The certifying agency is ISCKON. Link has been established with Super Spinning Mills in Coimbatore for purchase of certified organic cotton from farmers at a premium rate.

The following are details of activities and the number of farmers covered under IFD by MKVK in Erode district.

Table 2.1 – Details of Farmers Covered under IFD

Description of activity	Number of farmers
IFD components - hygienic cowshed with urine collection pit, Vermi compost, Panchagavya, Bio Pest repellent, Azolla as feed, Fodder plot , Kitchen garden	70
Bio gas	134
Promotion of medicinal and aromatic plant cultivation through LIESA practices	202
Promotion of ELS cotton through LEISA practices & cotton farm mechanization	160
Improved cultivation practices (LEISA) in Citronella	
(10 Ha)	36

(source – MKVK annual report April 2008-March 2009)

2.3 Impact

i) Impact on livelihoods

In Mysore, in MYKAPS project area, farmers have recently started converting to organic farming over the past four years. In Erode district, it has been ten years since the IFD model has been adopted. It is difficult to attribute rise in incomes to project intervention only as this could be due to rise in prices of agricultural commodities. However, what is clearly visible and certainly a result of project intervention is the considerable reduction in the use of chemical fertilisers and pesticides leading to savings among project area farmers. In HD Kote this reduction has been 100% in the case of all 24 farmers interviwed. The cotton farmers in HD Kote reported actual increase in incomes even in cases where there has been a decline in per acre productivity because of better rates and premium price for organic poduce being paid by the buyer. Hence the following factors have been considered as indicators of improved livelihoods:

- Increase in incomes
- Reduction in or complete stopping of purchase of inorganic fertilisers and pesticides resulting in savings
- Relief from indebtedness and repayment of old loans as farmers no longer need to borrow at high interest rates to buy organic inputs
- Improvement in food security
- Improvement in asset base

Increase in incomes: The cotton farmers in Mysore district reported actual increase in incomes because they are now grading and cleaning the cotton as a result of which they get a better price. Because of the linkage with Appachi Cotton they are also assured of correct weights and a fair deal. Appachi Cotton pays 23% extra over the market price for cotton that is of Grade A. Farmers also get 10-12% extra over prevailing market rates for cotton grown on fields that are in the process of conversion (i.e. farmers whose lands are between 0 to 36 months into the conversion period).

The following table gives the details of the quantity of cotton sold to Appachi Cotton in the months of September and October, 2009 only.

Table 2.2 –
Details of Cotton purchased by Appachi Cotton from farmers in HD Kote

Load No.	Date	Quantity (in Kgs)	# of Bags	Cost (in Rs.)
1	18.09.09	10644	251	343761
2	21.09.09	11236	272	347630
3	22.09.09	5205	125	158692
4	03.10.09	12072	294	350359
5	03.10.09	10896	254	305931
6	04.10.09	12999	315	377616
7	04.10.09	10724	252	303830
8	04.10.09	10615	236	308226
9	05.10.09	10664	255	313727
10	06.10.09	11845	278	344295
11	08.10.09	11186	295	345773
12	10.10.09	11841	281	348643
13	15.10.09	11196	279	332010
14	10.10.09	10312	243	306254
15	23.10.09	10703	282	311007
16	23.10.09	9436	240	281150
17	26.10.09	9763	250	308998
18	27.10.09	11522	292	357158
	Total	**192859**	**4694**	**57,450,60**

(Source – Half-yearly Report of Kabini Organic, April – September 2009, submitted by MYKAPS to Rabobank Foundation)

Of the 24 farmers interviewed in HD Kote, 19 grow cotton. Of these incomes per acre were calculated for 11 since the others could not recall accurately previous costs of inputs, rates, etc. Of 11 farmers:

- 9 farmers reported an increase in income per acre.
- 2 reported a decrease in income per acre

Out of 9 who reported an increase in income, 5 reported a decline in the per acre yield after conversion to organic farming. But even these 5 farmers reported increase in income because of higher rates realized.

The table below gives details of cotton growers interviewed in HD Kote

Table 2.3 – Details of Per Acre Yield and Production Expenses for Cotton – HDKote Farmers only.

#	Name of farmer	Village	Land hold-ing (in acre)	Before				After			
				cost of cultiv-ation/ acre (in Rs.)	yield qntl/ acre	rate Rs./ qntl	inco-me/ acre	cost of cultiv ation/ acre	yield qntl /acre	rate Rs./ qntl	income/ acre
1	Ganesh H.K.	Hosavaala	4.5	3900	5	550	2750	2950	2	3200	6400
2	Cheluvaraj	Hegganur	4	2500	5.5	1600	8800	50	3.5	2900	10150
3	Belliyappa (Kariyappa)	Nandinath-pura	9	2717	4	1600	6400	1050	4	4000	16000
4	Kalaswamy	Nandinath-pura	2	2000	3.5	1600	6400	50	1.5	3000	4500
5	NM Mani	Nandinath-pura	5	2000 + labour	2		don't know	labour (cannot recollect)	4	4000	16000
6	Anand	Badaga	2	2100	7.5	2000	15000	0	5.5	3000	16500
7	Rajashekhar	B.Mattakere	3.5	2500	5.5	200	1100	labour (cannot recollect)	5	3000	15000
8	Jayakumar	Bavikere	4.5	4000	2.5	2000	5000	3000	6	3000	18000

9	Balakrishna	B.Mattakere	10	4000	3.5	2000	7000	don't know	6	3050	18300
10	Machamma	Kebbepura-wadi	2	don't know	don't know	don't know	don't know	6000	11	2200	24200
11	Bommaiah	B.Mattakere	5	don't know	3	cannot recoll-ect	cannot recol-lect	6000	7	3100	21700
12	Ramegowda	Hegganur	4	not sure	3 to 6	1500-2500	8000		same as before	3600	14400
13	Madegowda	Hegganur	10	10-15,000 loan	8	cannot recollect	cannot recollect	cannot recollect, but exact figures available in dairy	4	2600	10400
14	B. Ramu	Nandinath-pura	6	3750	8	2150	17200	only cost of labour	4	3600	14400
15	Kemparaju	Nadadi	3	5000	4	2500	10000	3000	6	3200	12800

(Note – all farmers sell directly to Appachi Cotton and realize a premium value for grading and cleaning of their produce. Figures are based on oral recall by farmers.)

Reasons for shift to organic/LEISA farming

Reasons	*No of farmers citing this reason*
Could no longer afford to buy inputs	14
High indebtedness	6
Declining productivity, yields	4
Training, exposure, FFS experiments	7
Health reasons	3

T.P. Prakash from Telugu Masanahalli village in Mysore recollects how his sister's marriage in 2004 had left him deeply in debt. An already indebted Prakash was unable to raise any further loans for his cotton crop, hence he did not apply any chemical fertilisers to his crop that year. The yield was slightly lower than in previous years. However he had saved on input costs and health costs that were invariably incurred with the use of chemical sprays. Around the same time he attended an exposure programme to the organic farmer Subhas Palekar's farm (organized as part of training for the WDA of which he is a member). He realized that organic farming was the healthier alternative and decided to turn that way. In 2006 he joined SKS.

Improvement in Food security: The picture here was mixed as the reasons for shifting away from growing food crops varied. Two farmers in Erode district reported that now they do not grow any food grains; they grow only commercial crops and buy all their food grains. This is largely due to change in food habits – Nagesh for example was growing Ragi earlier but his children do not eat Ragi and hence the family has changed its eating habits to rice. Since he does not grow paddy, he has to buy it; he grows commercial crops.

Improvement in Asset Base – 13 out of 34 farmers (24 in Kote, 10 in Erode) reported that they have purchased assets and been able to repay old loans. Assets included TV, furniture, repair/construction of houses, investment in petty business, purchase and sale of goats. All the farmers in Erode district have increased infrastructure as part of IFD; these include Ecosan toilets, cattle sheds and vermicompost pits. Vermicompost has proved to be an asset in more ways than one – apart from providing valuable compost for their fields, farmers have also sold vermicompost and worms thus earning an income.

Improvement in Health – Improvement in health was seen by all 34 farmers as the major benefit of having turned to organic farming – and hopefully the reason that will sustain their faith in organic farming. In fact for Sithalakshmi and G.R. Shakthivel from Erode district this was what motivated them to begin farming organically.

GR Shakthivel is a model farmer belonging to Ganeshpuram village in Erode district. When he started farming his land in the eighties, he was a heavy user of chemical inputs. He used to spray pesticides excessively. So large was his requirement that he used to buy inputs directly from the wholesalers. A serious stomach ailment made him enquire about the causes. The allopathic doctors that he consulted said that surgery was the only remedy. Not wanting to submit himself to surgery, he turned to Ayurveda and was cured. Discussions on organic and sustainable agriculture practices were taking place in the Vikas Vahini Club meetings of which he was a member. This set him thinking about the health of his land. Around the same time Myrada also approached him with suggestions for LEISA practices in agriculture and he began to reduce his consumption of chemical inputs. He attended several courses at the Tamil Nadu agricultural university, made visits to the farms of several organic farmers in his area and is constantly innovating. He grows sugarcase, banana, vegetables and turmeric. In his first year of organic cultivation of sugarcane, the yield dropped from 60tons/acre to 50 tons/acre. There was a similar decline in turmeric too. However from the third year onwards he regained the yields; the quality of the yield has also improved. In fact he says that his vegetables have earned a reputation in the local market since they have good colour and do not spoil even after a week. Regular dealers to whom he sells, pay 20% extra because they recognize the value of 'GRS vegetables' as his vegetables are called in the market. Today he is a complete organic farmer. According to Shaktivel, in chemical farming the soil gets absolutely no rest. It destroys the physical properties of the soil. 2 tons of fertilisers are enough to destroy the properties of 20 tons of soil he says. He has been maintaining a dairy since 1989 and is also testing his soil regularly and so knows that his soil has regained its original health as the soil's pH level now is what it was before he began applying chemicals.

Many farmers reported problems such as headache, vomiting, urinary and respiratory problems while using chemical pesticides. Since they have stopped using chemical pesticides they no longer face these problems.

However, on the other hand, the overall sales of inorganic pesticides has grown. A dealer in chemical inputs at HD Kote said that his brother who used to attend to customers at the shop had developed aplastic anemia. They have spent thousands of rupees on his treatment in Vellore but to no avail. He is not sure if this is an effect of continuous exposure to chemicals,

Eco-Sanitation

however he suspects that it could be so. He himself feels sick by the noxious smells in his shop but has to continue as it is his job. However he has seen no decrease in sales of chemical inputs, in fact he has been registering an increase of approximately 5% in sales every year.

Findings from other Studies on impact on livelihoods :

A study of the IFD farming strategy conducted by students of University of St.Gallen, Switzerland (Philip Wels and Vanessa Nadolski) in Erode district in November 2009, concludes that there is an increase in income based on calculations of production, reduction in input costs, opportunity costs and health costs. The researchers interviewed 45 farmers in 7 villages in the hills and plain areas where MKVK operates. The increase in incomes was not only due to increase in crop production but also due to many other factors such as increased production of milk (due to use of azola) and sale of vermi compost. Taking all these into consideration, the study concluded that there was an average rise in income from Rs.18959/year to Rs.30206/year. However the rise in income is not over one year but over a continuous period, pointing to the fact that increased incomes cannot be expected immediately after implementation of IFD but only after a period of time. This is also the opinion of the farmers; all of them stated that organic farming is not for those who expect immediate returns. The study also calculated the savings that can accrue to a family by reducing costs on

- Chemical fertilisers and pesticides
- Fuel by adopting bio gas
- Fodder
- Health care (of humans and cattle)
- Vegetable consumption through adoption of kitchen gardens
- Opportunity costs in collecting fodder and firewood

By calculating the average costs that a family would incur on the above items in a year, the study estimates that it can save Rs.5818 per year.

ii) Impact on change in farming practices, crop diversification :

With the introduction of organic farming, farmers have adopted several new farming methods such as mulching, usage of farm waste, efficient usage of water like drip irrigation, intercropping, mixed cropping, growing of trap crops, etc. All farmers now make their own inputs such as Jeevamrutha, Panchagavya, vermi compost. All the farmers who are members of SKS and Kabini Society in Mysore district maintain dairies of their farm activities covering crop management, storage and output which also record changes in farming practices.

Since all farmers have participated in watershed development programmes, they have done bunding on their fields for soil and moisture retention. People have also changed from

food crops to cash crops – especially to sugar cane and turmeric. The following table gives examples of the new practices adopted by a few farmers.

Table 2.4 – Details of Changes in farming Practices and crop diversification

Name of farmer	Earlier Practice	Current Practice
Ganesh H.K. Hosavaala	Grew only cotton in the cotton plot	Does intercropping. Plants one line of green gram in between cotton
Cheluvaraja, Hegganur	Flood irrigation Burnt leaves and other plant waste in the field Hired labour for picking cotton, weeding, spraying, fertilizer application	Drip irrigation Does not burn any plant waste, uses it for mulching/compost Stopped hiring labour even for picking, fertilizer application – uses only own labour now
Madegowda, Hegganur	Broadcasting ragi seeds. Used 20 ser seed for 1 acre.	Transplants seeds now. Planted at distance of 1 x 1 feet. Less than 10 ser seed for 1 acre. He claims that weeds are less in broadcasting hence he saves on labour cost.
Kalaswamy, Nandinathpura	Grew pulses along with cotton – mixed cropping	Growing castor as trap crop around cotton along with mixed crops such as lab lab, horse gram. Also grows marigold and ladies finger as trap crops.
Anandappa, Badaga	Destroyed all weeds and waste in an attempt to 'clean' the land	Weeds and plant waste used for mulching
Dassiah, Uyyamballi	Monocropping	Mixed cropping

Shakthivel from Ganeshpuram village follows many new practices – many of which are his own innovations. He has for instance fashioned a clod-breaker out of an old cart wheel which is used on the field to break clods of earth. He has set up a system of filtration for his drip irrigation system and applies EM[13] (Effective Micro Organisms) and cow urine through the drip system. The multi layered filtering system ensures that the tubes in the drip system do not get blocked.

A few farmers in Mysore mentioned moving away from hiring labour to using their own labour or the system of exchange of labour (muyyalu) which is prevalent in this area. While

13 A trademarked term used for a combination of anaerobic micor organisms that hastens decomposition of organic matter in the soil thereby improving its fertility. EM concentrates are available in the market.

labour unavailability was not seen as a problem by farmers in Mysore, farmers in Erode district perceived it as a major problem. In fact all of them – big as well as small farmers – strongly believed that NREGA programme had taken away labourers from their farms. The bigger farmers see mechanization as a solution to this problem.

Many farmers also reported growing crops that they had not grown before – notably, sugarcane, turmeric and vegetables. While a shift to commercial crops is not surprising, two farmers reported returning to crop varieties that their parents grew. Kariyappa from Nanthinathpura said that he started growing Navane (foxtail millet) which had not been grown in this area for many years. It was commonly grown and consumed during his parents' time and his mother had preserved some seeds long ago. He planted them in a plot and they germinated. He now continues to grow this millet. Similarly, Ganesh from Hosavaala has now begun to cultivate a local variety of paddy 'kanaal paddy' which his father used to grow and cultivation of which had stopped in this area.

Table 2.5 gives a sample of farmers who have changed their crops for various reasons

Table 2.5 – Reasons for Changes in Crops Cultivated

Name of farmer	Earlier Crop	Current Crop
Sivakami, Adireddiyur	Groundnut, sesame, maize, vegetables	Maize, sesame. Stopped growing groundnut due to unavailability of labour. Has not planted vegetables this year.
Nagaraj, MP Doddi	Ragi, pulses	Maize (due to elephant attacks)
Nagesh, MP Doddi	Ragi, pulses, vegetables	Garlic, onion, turmeric, sugarcane and vegetables after bore well was sunk. Does not grow any food grains now
Cheluvaraj, Hegganur	Cotton, ragi, pulses	Cotton, ragi, pulses, vegetables, sugarcane. New crops started after watershed activites (bunding, drip irrigation)

Madegowda is a 55 year old farmer from Hegganur village in Mysore district. He has 10 acres of land of which four acres are irrigated. He is a member in the Mahadeshwara SAG and also a member in a WDA. As a member of the WDA he has attended many training programmes on organic farming practices and visited fields of organic farmers in Malur, Bangalore and other places. Around 5-8 years ago, he found it increasingly difficult to practice agriculture – he could no longer afford the costs of inputs. He began to seriously consider the option of returning to organic methods – the way he used to farm when he was very young. In 2006 he joined SKS and is now fully convinced of the organic approach.

He grows ragi, cotton, sugarcane and vegetables. He has improved cropping practices in ragi – transplanting instead of broadcasting thereby saving on seed costs. With motivation from SKS, he has started collecting and preserving seeds of local varieties of ragi. Today he has saved around 26 indigenous varieties of ragi including Jenumuthaga, Jagalur, Jenugoodu.

He grows more varieties of vegetables now than before. Earlier he used to grow only brinjal and tomato. Now he grows carrots, beetroot, onion, potato, chilly, pumpkin. Vegetables fetch him a daily income. He has also planted sugarcane on one acre. He wants to try growing cabbage and cauliflower organically – something that has not been attempted as yet in his area; he has not visited any farm where cabbages are grown without the use of chemical pesticides.

He has reduced the extent of cotton from around seven acres to two acres of organic cotton. Earlier he was perpetually under debt to the tune of Rs.15000/- he was always indebted since as he would borrow immediately after one loan was paid up. Now he does not borrow at all since he prepares all inputs himself. He has also repaid all old loans. He is now able to keep a track of all his expenses and incomes as he maintains the farm dairy. In fact he maintains a small pocket book as his rough diary on the farm, transferring the entries in to the 'fair book' at the end of the day. Today many farmers from all over the country visit his field to learn from him.

His health has improved and so has the health of the soil. The soil has become soft and moist. It looks like manure and ploughing is easier. 'I have fun going into my field now. Even my bullocks enjoy ploughing. He has seen the fields of his neighbours who continue with inorganic farming, turn barren and infertile and wishes to retain the goodness of the soil in his farm. Hence he does not have the heart to apply chemicals to his field ever again.

iii) Impact on production and productivity

It has been established that farmers who have been using inorganic inputs experience a decline in yields in the initial years when they stop or reduce the usage of these inputs. This has been one of the greatest obstacles in the promotion of organic agriculture. However farmers in these project areas reported that they were seeing a gradual decline in yields in any case due to the deterioration of soils. Balakrishna from B.Mattakere has 10 acres of land and used to grow cotton in 8 acres. He used to get around 3-4 quintals/ acre which started coming down, till 4 years ago when he got only 1.8 quintals from 10 acres. That year he gave up agriculture completely and gave his land on contract, resuming it again only last year when he joined Kabini Organics. He now grows cotton on 3 acres. At a meeting with the Directors of the Company many of them shared

similar experiences. Around 20 years ago DCH variety of cotton yielded around 20 quintals per acre. This has come down to 2-3 quintals per acre now. Costs of inputs including labour continued to rise. It is in this context that changes in productivity and production needs to be viewed.

Even where cotton yields per acre have declined, farmers have yet recorded a profit because of the drastic reduction in input costs. Refer to Table.2.3 for details of changes in production and productivity of cotton farmers.

Examples of changes in productivity in other crops:

- When Ganesh HK from Hosavaala in Mysore district grew sugar cane using chemical inputs, his yield was 40-50 tons/acre. He used to sell cane to the Bannari Amman Sugar factory in Sathyamangalam who pay Rs.1200/ton after deducting loans and transportation charges. He was dependant on the factory for transportation and payment was often late. He has now started growing sugar cane organically and his yield is around 25 tons/acre. This season (2009) he got 60 tons from 2.5 acres. However he feels that his soil is enriched every year because he uses only organic inputs which he prepares himself using materials available on his farm. He sells sugarcane to SKS for use in the jaggery processing unit. They pay a premium rate of Rs.2000-2300/ton after deducting all charges towards handling, transportation, etc. There is also the option of payment in advance.
- Shakthivel from Ganeshpuram in Erode district grows sugarcane. He used to spend around Rs.40,000 on an acre on ploughing, weeding, pesticides and fertilisers when he used inorganic inputs. Now he has shifted completely to organic methods of farming and his production costs for sugar cane has been reduced by half.
- Mohan of Kulatakadu village in Erode grows bananas in one acre. Earlier he used 5 bags of DAP, 5 bags of potash and 2 bags of urea. He has now reduced those inputs by half. He applies poultry manure and vermicompost. His yield has now declined by around 25%. However the bunch weight has gone up and colour has also improved. He now follows plastic mulching – a practice introduced by MKVK. The banana bunches are covered with a plastic sheet which facilitates even ripening of bananas.

Ultimately, whether they cultivate organically or inorganically all farmers are dependant on good rains for a good yield. Many farmers reported low yields this year due to failure of rains. The following case illustrates poor results due to natural causes such as failure of rainfall, attack by wild animals and also ineffective utilization of farm resources due to improper planning.

Nagaraj is a dry land farmer belonging to MP Doddi village in Erode district. He has 4 acres of land and has also leased in 7 acres of land. He grows ragi in one acre and maize in 10 acres. In 2007 he harvested 200 quintals of maize, in 2008 he got 90 quintals and in 2009 only 65 quintals. The decline is because of poor rains. He used to grow ragi and pulses about 8 years ago and shifted to maize because the crop was being attacked by elephants. Sadly, last year he lost maize crop in around 5 acres to wild boars.

He has adopted IFD components such as cattleshed management, bio gas and vermicomposting. However he has not reduced his consumption of chemical inputs. Except in 2007, when he used vermicompost on one acre of maize and reduced use of DAP to that extent.

In some seasons, the compost was not ready in time for his crop; he also has to wait for the rains to arrive before he can apply it. Hence he sells it to farmers who have irrigation. He has sold 10 kilos of worms and seven tractor loads of vermicompost at Rs.1000 per tractor load. He has now borrowed Rs.40000 from his SHG to dig a bore well.

iv) Impact on soil health

Project staff mentioned how there has been a visible change in the colour and texture of soil where LEISA and organic farming has been practiced for 3 or more years. 21 farmers out of the 34 interviewed reported this change too. They said that the soil is now looser and cooler than before and has greater moisture retention capacity. Madegowda from Hegganur village in Mysore district says that the soil looks like manure. It is soft and loose as a result of which ploughing is easy. Many farmers reported this change in the appearance of the soil; "it looks blacker, it shines, it is soft and moist", etc. As a result of the improvement in the soil, the crop quality has also improved – the ragi crop does not dry up like before, say the farmers. The soil quality is reflected in the improved colour and height of the crop and also the taste of food. Another indicator of the health of soil is the increased number of earthworms that farmers find in their fields. Ganesh from Hosavaala in Mysore district has noticed an increase in the bird population nesting in the vicinity of his fields as result of the increase in earthworms. He says that the birds will help in pollination as well as prey on insects that may harm the crops. G.R. Shakthivel, from Ganeshpuram in Erode district shifted to organic farming in the nineties after facing health problems. He is now a staunch advocate for organic farming. He has been testing his soil regularly and the pH level of his soil in 2008 has returned to what it was in 1982 – the year he first tested the soil at a time when chemical inputs were not yet applied to his field.

The MKVK in Gobichettipalayam has a full-fledged lab with soil, water and plant testing facilities which farmers use regularly. The table below shows the extent of utilization of the facility

Table 2.6 – Details of soil samples tested in MKVK (as of March 2009)

Year	Number of samples analyzed	Income generated (Rs.)
2005-06	153	3,310.00
2006-07	1243	37,125.00
2007-08	1702	48,290.00
2008-09	1535	53,435.00
Total	4633	1,42,160.00

(Source – MKVK Annual Report to MYRADA)

Based on test results, the MKVK advises farmers on farm nutrient application. Recommendations are always based on LEISA and training programmes are held regularly for farmers. It has analysed samples from Erode and neighbouring districts. It has produced a report on the characteristics of various soils in Erode district, problem soils and management strategy for the same. A sample soil test report is attached in Annexure 2f.

Bund Plantation - fuel & compost

Vermi Compost

Findings from other studies:

The study by Philip Wels and Vanessa Nadolski (students of St.Gallen University Switzerland) records the positive impact on the environment due to adoption of IFD components. It records a reduction of 74% in burning of firewood by a family that has established a bio-gas unit. A team of KVK scientists who visited the

MP Doddi village in Erode district (which is being promoted by MKVK as an IFD model village) observed a clear trend in reduction of consumption of firewood due to use of bio gas. Not only is there a reduction in cutting of trees from nearby forests, there is also an increase in biomass planting of trees such as Cassia siamea, Glyricidia, Neem etc.

The study report of the St Gallen students also points to the potential of the IFD model and organic farming in reducing environmental pollution by eliminating the toxic hazards associated with chemical fertilisers and pesticides. Exposure to pesticides is suspected to cause several diseases such as certain types of cancer, birth defects, abnormalities, etc. The use of organic inputs has beneficial effects on the environment such as increasing the nitrogen content of the soil, increasing the microbial activity in it, reduction in energy required to mass produce and transport fertilisers.

Eco san toilets also play a major role in preventing pollution and improving health status of families. Fecal matter is safely disposed off; it turns it into odourless manure that can be used in fields. All farmers in the MKVK reported using the manure without any reservations.

2.4 Value Addition, Spread Effect and Advocacy

i) Value Addition: Farmers have added value through several of the project interventions such as grading, cleaning, processing and documentation.

Grading – This has been one of the major value additions for farmers. In Mysore district farmers have been linked to Appachi Cotton and in Erode District to Super Spinning Mills, Coimbatore for purchase of organic cotton.

The link with Appachi Cotton in Mysore district has helped farmers get better price for their produce. All farmers have been trained to clean and grade their cotton before they bring it for sales. The Company pays 23% over the market price for A grade cotton. It also pays 10% over the market price for cotton grown by farmers whose farms are in the conversion period. Since certification costs are high (at Rs.80,000/ year), in Mysore district, group certification is being sought with half the cost to be met by ITC, provided ICS norms are adhered to. In Erode district, talks are on with ISKCON for bearing certification costs; ISKCON may also procure sugar cane in future.

Grading has helped inculcate quality-consciousness in farmers. The companies purchasing cotton follow fair trade practices of correct weighing and grading.

SKS has tie-ups with many agencies for procurement of vegetables. Members of the Gujjamma Savaya Krushakara Sangha, an SHG of organic farmers in Hegganur get a good price for their organic vegetables which are procured by a company called Elements in Calicut. They grow beans, bitter gourd, cabbage, ridge gourd, pumpkin, tomato, chilly. The following table compares the rates given for organic and non-organic vegetables.

Table 2.7 – Comparison of rates for organic vegetables vis-à-vis non organic

Vegetable	Rate paid by Elements	Rates at local market
Beans	Rs.18/kg	Rs.5-12/kg
Tomato	Rs.15/kg	Rs.3-8/kg
Chilly	Rs. 35/kg	Rs.15-20/kg
Onion	Rs.25/kg	Rs.12-15/kg
Brinjal	Rs.15/kg	Rs.8/kg

Note – current rates stated as on date of interaction, viz. February 2010. Rates of commodities are reviewed and revised every six months after the SKS committee fixes the price.

SKS has a jaggery processing unit and hence procures sugar cane from its members by paying an additional value over that paid by sugar factories. It also procures ragi, sesame from its members at retail price. Farmers pay 2% of their income from the sales to SKS as service charges.

The value addition has been both in terms of the produce as well as in terms of increased knowledge and awareness of farmers. Members of SKS and Kabini Organics maintain farm dairies as mandated by the ICS. All of them mentioned that the diary gives them a definite advantage. They are now able to keep track of all their expenses; they know what inputs they have used, how much they have spent and also on what dates their field operations take place. This helps in preparing detailed farm and crop plans which is also mandated by the ICS. An extract from a farmer's diary is attached at Annexure 2g.

Farmers also value very highly the various training programmes and exposure visits that they have attended. Much of their learning and sharing has come through these visits. Increased knowledge and awareness of organic methods of cultivation, group management processes, certification norms, etc. has added to their confidence.

ii) Spread Effect

In Erode district, where MKVK is actively involved in extension activities, the spread effect can be seen more clearly.

Many IFD models have been established in the district which are motivating neighbouring farmers to adopt all or part of the IFD components.

The fibre-drum model of bio-gas plant which was popularised by MKVK has now spread to other projects in MYRADA and has been adopted by other NGOs and government agencies in Erode and neighbouring districts.

Farmers who began with LEISA have begun to move to organic farming. As of March 2009, 112 farmers who were practicing LEISA have shifted completely to organic farming.

In HD Kote too, farmers reported that neighbouring farmers are getting interested in organic methods of farming. Village groups have adopted the rules of SKS and are functioning on similar lines as is illustrated by the following case of the Gujjamma Savaya Krushakara Sangha in Hegganur village

Case 4 – The Gujjamma Savaya Krushakara Sangha in Hegganur has 22 members (all men). The group began as a WDA in 2003 when MYRADA was implementing a NWDPRA watershed project. The WDA still exists. It functions like an SHG with weekly meetings and engages in savings and credit. All of them are also members of SKS. Those members of the WDA who were interested in organic farming got together to form this group. They have been exposed to Subhas Palekar's farm and have been trained in the use of vermi compost, neem pesticides, beejamrutha, jeevamrutha, etc. The members say that they faced decline in yield during the conversion period, but it recovered after complete conversion. The group has members who are still in conversion period as well those who have completely coverted. They say that those who look for immediate results cannot go in for organic farming. Only those who are genuinely interested in this method can sustain it. Mani who is a new member to the group said that rising costs of inputs was worrying him. He saw his neighbour's diary and noticed that the expenses were quite low. That motivated him to turn to organic farming and he joined this group.

The Gujjamma group has the same rules and regulations as that of SKS. In addition they have certain rules such as not purchasing any inputs from outside, motivating other farmers to start practising organic farming, ensure that grading is done properly.

They have also imposed conditions on members that each one must maintain a bee-keeping box.

They are quite clear in articulating their demands of the government: the government must: a) provide good quality untreated seeds for growers of organic cotton; (b) provide subsidies and promote organic farming instead of providing only lip-service. They also insist that the burden of certification must rest with the government rather than on the farmer.

They say that many conventional farmers still consider them to be odd. They continue to resist such comments and adhere to the strict rules required for certification inspite of setbacks. For example one member who was in the third year of conversion slipped back to year one when he asked his neighbor to store his organic cotton crop in his house for one night; the storage was used for inorganic cotton; however he is undeterred and continues to be an organic farmer.

Their vision is to have their own outlet for marketing their produce in Hand Post HD Kote. They aim to become well-known as producers of high-quality organic produce so that buyers come in search of their produce. They also wish to start producing cotton seeds for organic cotton growers.

Interactions with fertiliser shops in HD Kote indicate that there has been no decline in sales of chemical inputs. The shopkeepers were asked if there has been any reduction in sales of

chemical inputs and if any of their regular customers has stopped buying from them. Of the three fertilizer shops in HD Kote (one in Hand Post and two in Sargur), two reported that they have seen a steady increase in sales over the years. One shop owner said that due to the low supply of fertilisers in the past two years, the current demand is not being met. All three of them agreed that chemical fertilisers and pesticides cause harmful health effects but they do not think that organic farming is an answer because production goes down. They said that most customers had no knowledge of what fertilizers/pesticides to buy and often depended on the dealer for advice and information. One farmer (sugar cane grower) who had come into buy NPK at the shop in Hand Post was asked how he made decisions on when and what fertilisers to buy. His answer was simple – when he has money he purchases fertilsiers and when he does not, he does not buy.

Of the three fertiliser shops visited in Thalavadi one shop mentioned that it sells bio-fertilisers and that there is a growing demand for it. The other two shops sold only chemical inputs and reported no decline in sales. One of the shops reported that one of their regular customers Shaktivel had stopped buying fertilisers as he has turned to organic farming.

iii) Advocacy, policy change

MKVK grade is today recognized by ICAR as one of the few KVKs promoting LEISA IFD and organic farming. ICAR has also approved the IFD model innovated by MKVK. In 2009, four KVKs in South zone have adopted IFD for demonstration in their respective districts. MKVK is now a leading resource agency in the district for conducting training programmes on organic farming. In 2009, with support from the National Horticulture Mission, it organized a Training of Trainers for 1200 leading organic farmers of the district. It is currently preparing a trainers' manual. MKVK regularly produces several publications and newsletters for dissemination amongst farmers, NGOs and government agencies.

MYKAPS in Mysore district has been lobbying in partnership with Appachi Cotton to get labour used in organic farming recognized as valid for payment under NREGA. Since Appachi Cotton is a member of the Cotton Corporation, it is lobbying for this. Organic farming is labour intensive and this measure if introduced will certainly help in promoting organic farming.

SKS and Kabini Organics in HD Kote have been lobbying for more flexibility in certification norms and actively campaigning against genetically modified crops. For certification, it is important for fields under organic practices to be contiguous in order to prevent contamination from other fields. SKS is lobbying to get this condition changed so that farmers who are genuinely interested in organic farming are not prevented from obtaining certification if their neighbouring fields are not organic. SKS participated in the public hearing regarding the introduction of Bt.brinjal and sent a representation to the Minister of Environments and Forests strongly opposing the introduction of genetically modified food crops.

2.5 Observations and Conclusions

- It is quite clear that LEISA and organic farming have provided clear benefits to the farming community and hence needs to be promoted more vigorously. There is a clear reduction in costs especially due to reduced use of chemical fertilizers and pesticides. Farmers also expressed pride at being able to produce their own inputs; they are fully in control of and own the indigenous technology of producing their own inputs using materials available in their fields. The organic farmers of Mysore share a common ideology – that of respect for the environment and human life and a realization of the interrelatedness of life.
- Another clear benefit is the improvement in health condition of farmers and of their soil. The changes in soil are visible even to the naked eye and lab tests have validated farmers' observations. From being hard and unyielding, the soil has become soft and cool.
- Farmers report an increase in quality-consciousness and greater bargaining power. They now feel that they can demand a better price for their products as organic products are of superior quality. Grading and processing have served to add value to the farmers' products.
- There are also several issues of concern; the first is whether interest in organic farming will sustain. Though in this particular region farmers have been experiencing declining yields for years and hence have welcomed the shift to organic farming of their own accord, there is yet the possibility of a relapse into chemical farming. This is especially so in the case of farmers cultivating commercial crops such as sugar cane, banana and spices. As long as there are buyers who will pay a premium for organic produce, farmers will continue to grow organically. Hence it is necessary to ensure that awareness among consumers is promoted and that market linkages are established. The role of institutions is also vital in ensuring continued faith in and commitment to organic farming. The perception that organic farming is only for the rich or for a few eccentric farmers still exists. Hence the support provided in the groups is absolutely necessary. Continuous discussions and reiterations in group meetings serve to reinforce faith in organic farming in spite of scelpticism/ opposition from others. The group of organic farmers is a small minority in the farming community. As farmer Ramegowda puts it, 'I don't have the heart to apply chemicals on my land (sarkaari gobbara haakakke manassu antalla). We talk about this [organic farming] so much in the group meetings and training programmes. I cannot say one thing and do another'
- Organic farming continues to be practiced by a minority and has not been mainstreamed. However given the fact that soils are being depleted of their fertility, there is the potential to bring in more and more farmers into the organic fold. The contention that organic farming cannot meet production requirements of the

population no longer holds good for two reasons: a) Farming with chemical inputs has in fact decreased production as farmers have experienced; (b) The decline in productivity on conversion to organic is offset by cost savings in initial years, better prics for products and rising outputs in the long term. It is therefore necessary to study the actual impact on incomes in the medium to long term, through quantitative measures. The results of such studies need to be published widely to remove several popular misconceptions about organic farming.

- Fertiliser shops in the area still record increasing sales – pointing to the fact that a majority of farmers continue to use chemical inputs. Most farmers seek the dealer's advice on fertilisers much as patients buy medicines at the advice of pharmacists rather than consult a doctor. There seems to be enough evidence that farmers buy fertilsiers only when they have money or access to credit which is costly. Given this fact, there is a potential to widely publicise the benefits of organic farming as a means of reducing costs of cultivation for the farmer.
- Another area for concern is the availability of bio-fertilizers in the market. One dealer in Thalavadi had stocked bio-fertilisers, which he claimed was quite popular. How valid or genuine are such products? Do ready made organic products, stocked by dealers, meet certification standards? Practitioners of organic farming advocate the preparation of inputs by farmers themselves in order to ensure organic integrity. Given the lack of labour, it might be argued that purchase of organic inputs may be the easier solution. However, the purpose of making farmers self-sufficient will then be defeated as farmers may fall back into the cycle of indebtedness if they are to buy inputs.
- Availability of untreated seeds and the discipline required to meet certification standards continues to be an issue. It is difficult to obtain untreated seeds. For example in the last season only Bt Cotton seeds were available as private business paid a commission on sales of Bt Cotton seeds. Since organic integrity should be traceable from the seed to every stage of growth and storage, it is important for organic farmers to have access to seeds that pass accreditation standards. Farmers in Mysore have decided to grow and preserve varieties of cotton seed which are untreated.

Annexures for Section 5…

Annexure 2a

Guidelines for Interactions with SKS/Kabini Members and Erode District Farmers

i. SKS Farmers

Name of farmer: ----------Village: ----------

No. of family members: ----------

Extent of land: ----------

Dry/ Irrigated land ----------

Member of ---------- since ----------

Membership in other CBOs ----------

Trgs attended: ----------

Exposure visits:----------

How did trainings help? ----------

What has motivated them to go organic: ----------

	Before	After
Crops grown with area		
Practices		
Input with costs and quantity Where procuring		
Yield		
Health of soil		
Income from land –		
From crops Value addition		
No of cattle and Income from livestock		

Advantages/ disadvantages of organic farming:

Use of income (purchase of assets, housing, health, education, entertainment, travel, ……..):

How do you manage documentation: (literacy skills)

ii. Kabini farmers

Name of farmer: ---------- Village: ----------

No. of family members: ----------

Extent of land: ----------

Dry/ Irrigated land ----------

Member of ---------- since ----------

Trgs attended: ----------

Exposure visits:----------

What has motivated them to go organic: ----------

	Before	After
Crops grown with area		
Practices		
Input with costs and quantity		
Yield		
Income from land –		
From crops		
Value addition		
Income from livestock		

What was their motivation ----------

Hurdles ----------

How do you manage documentation:

What is the support you are getting from extention staff? What area?----------(certi, nutrient mngmt, mktg, input supply, …)

How do you see the future with becoming a Producers Company? How does this impact you? ---------- (sustainability issue, management..)

iii. Erode District Farmers

Name of farmer: ---------- Village: ----------

No. of family members: ----------

Extent of land: ----------

Dry/ Irrigated land ----------

Trgs attended: ----------

Exposure visits:----------

What has motivated them to go in for LEISA: ----------

	Before	After
Crops grown with area		
Practices		
Input with costs and quantity		
Yield		
Income from land –		
From crops		
Value addition		
Income from livestock		
Soil Health		

IFD components adopted: ----------

Hurdles ----------

Annexure 2b

List of Farmers Interviewed

MYKAPS, H.D.Kote, Mysore District

#	Name	Irrigated/dry	Crops grown	Acreage
1	Ganesh HK	Irrigated	Cotton, sugarcane	4.5
2	Manjunath HB	Irrigated	Banana, sugarcane	16
3	Cheluvaraj	Partly irrigated	Cotton, sugarcane	4
4	Madegowda	4 acres irrigated	Ragi, vegetables, cotton	10
5	Belliyappa (Kariyappa)	Dry	Cotton, ragi, pulses, vegetables	9
6	Kalaswamy	Dry	Cotton, rag, pulses	2
7	Kariaiah	Dry	Cotton, ragi, pulses	2
8	NM Mani	Dry	-do-	5
9	TP Prakash	5 acre irrigated	Sugarcane, vegetables	10
10	Ramegowda	Irrigated	-do-	4
11	Dassaiah	Dry	Ragi	4.5
12	B Ramu	Dry	Cotton	6
13	Anandappa	Dry	Cotton, vegetables, pulses	2
14	Rajashekhara	Dry	Cotton, pulses	3.5
15	Jayakumar	Dry	Cotton, ragi, vegetables pulses	4.5
16	Balakrishna	Dry	Cotton, ragi, pulses	10
17	Macahamma	Dry	Cotton, ragi, dryland paddy	2
18	Lakshmibai	Dry	Cotton, ragi, pulses	2
19	Bommaiah	Dry	Cotton, ragi, pulses	4 + 1 wasteland
20	HV Srinivas	8 acres irrigated	Cotton, banana, sugarcane, tobacco, paddy, pulses	14
21	Chikkaswamy	Dry	Coriander, tobacco, paddy	12
22	BM Sundardas	6 acre irrigated	Sugarcane, banana, cotton, tobacco, chilly	13
23	Kemparaju	Dry	Cotton, ragi, turmeric	3
24	Vithal	Irrigated	Cotton, ragi, sugarcane, chilly	3

MKVK, Erode District

#	Name	Irrigated/dry	Crops grown	Acreage
1	GR Sakthivel	5 acres irrigated	Sugarcane, banana, turmeric, ragi	10
2	Nagesh	Irrigated	Sugarcane, onion, potato	3
3	Mahadevappa	Dry	Ragi, maize, jowar, pulses	5
4	Nagaraj	Dry	Ragi, maize, jowar	7
5	Basavanna	Irrigated	Sugarcane, turmeric	3
6	Mohan/Vijaya	Irrigated	Banana, turmeric, sugarcane, paddy	12
7	Senthil –non area farmer			
8	Kalaivani	2 acres irrigated	Maize, cotton, vegetables, pulses	9 acres
9	Sivakami	Dry	Sesame, maize, vegetables	3
10	Raja Manikyam	3 acres irrigated	Tobacco, cotton, jowar, pulses,	5
11	Sita Lakshmi	Dry	Jowar, pulses, millets, ragi, groundnut	3

Annexure 2c

SKS Membership Criteria

1) No parallel Cultivation
2) No land lease out or lease in.
3) No Tobacco Cultivation
4) No use of Genetic Modified Seeds
5) No use of chemical pesticides and Chemical Fertilizer.
6) A minimum of 5 Members should become members from each village
7) At village level Member have to conduct weekly meeting.
8) Attend meeting / training held time to time at own cost.
9) Members have to write daily dairy
10) Members have to furnish exact land holding and map.
11) Members have to abide by the internal control system of the association.
12) Members have to bear the organic certification cost.

Annexure 2d

Brief Overview of ICS Norms

1. Social and Environment Ethics
   a. Organic farmers who are entitled to use this term to describe themselves shall have a clear understanding of their responsibility to themselves, their family, their land and other organic stakeholders.
   b. They shall have a concept of the interrelatedness of life in order to put into practice a holistic approach to the microcosm of an organic farm
   c. An organic farm grows organic food with the intent of own consumption first and intent to sell second
   d. Organic farming families or units shall strive to evolve sustainable lifestyles and be an example to the community in which they live.
   e. Organic farmers and stake holders shall together respect the organic principle in taking care of the Earth and her living and non-living resources and thereby build socially and economically equitable relationships
2. Physical Characteristics of an Organic Piece of Land
   a. An organic piece of land is one where synthetic and chemical inputs, including inputs produced by genetic engineering, are not permitted and where the natural ecology of the farm is protected as much as possible by the use of sustainable agricultural practices.
   b. It should be ideally situated at a reasonable distance from urban and industrial areas to minimize heavy metal pollutant presence in the organic food system.
   c. Such fields should be situated above low lying lands and wastelands and have adequate drainage systems to prevent the entry of rainwater and irrigation water from conventional fields from entering the organic farm.
   d. This land shall be fenced off from non-organic fields with a live fence of 2m height and 1m width, leaving a distance of 3m between the two
   e. IN cases where this is not possible a crop of the same dimension can be grown thickly and harvested only at the end of the season and sold as conventional fodder/ waste. This crop fence shall be a different species from the organic crop being grown in the field.
   f. Appropriate bunding and vegetation should be put in place to prevent soil and wind erosion within the farm as well as prevent contamination from conventional fields from entering the organic field at every possible point of entry.
   g. AN organic plot can be no less than one acre but it is preferable that one acre or less plots be combined with other organic farmers to make a group of fields

3. Cultivation Conversion Parameters – These are listed in detail including start of conversion period, its definition,
4. Parallel Cultivation Parameters – Parameters for management where both organic and conventional crops are grown on the fields in the same farm. Such farms are not to grow GM crops and must give a clear plan to convert to completely organic within 3 years
5. Management of Contamination
   a. It is the responsibility of the farmer to take all necessary and reasonable steps to identify and avoid potential contamination.
   b. All kinds of measures including barriers, charcoal lined soak pits and buffer zones should be employed to avoid potential contamination and limit contaminants in organic products especially around the perimeter, irrigation in-flows , in household spaces and/or in organic produce storage areas including packing material.
   c. In case of a reasonable suspicion of contamination , MYKAPS will ensure that an analysis of the relevant products and possible sources of pollution (soil, water, air, inputs) is undertaken to determine the level of contamination and then will take the necessary steps to detect the source of contamination, considering background contamination and other relevant factors.
   d. For the use of synthetic coverings, sheets and insect nettings, only products based on polypropylene, polyethylene or other polycarbonates are permitted. These are to be removed from the farm after use and not burned on farmland.
   e. All equipment from conventional farming systems shall be thoroughly cleaned of potentially contaminating materials before being used on organically managed ones. Further, in parallel cultivation equipment for organic and conventional areas shall be kept separately and be identifiable.
   f. Organic farms should be at least 3 km away from GM crop areas. Where this is not possible the organic fields shall have a thick impenetrable live fence up to 3m height at least. In these circumstances it is not permitted to grow the same species as the GM crop.
6. Management of Bio-diversity And Wilderness – Norms on maintenance of vegetation on fields (instead of 'cleaning' the land), planting of minimum of trees, planting of live hedges, prohibiting of use of harmful practices such as rat poison, dynamiting fish, etc.
7. Norms for crop and soil management – intercropping, crop rotation, mulching, choice of local plants and a mix of fibre, fodder and fuel plants;
8. Seeds and planting material – to ensure that seeds, rootstock and planting material are sourced from local areas and where organic assurance is confirmed; No planting of GM seeds; preference to open-pollinated seeds

9. Soil fertility and manuring practice – to ensure that no toxic materials are used and preference to water-saving practices such as drip-irrigation, mulching, rain water harvesting systems
10. Pest disease, weed and growth management – stress on locally available materials for preparation of bio-repellants, promotion of biological methods of plant protection such as pheromones, planting of trap crops, etc.
11. Machinery, Tools And Energy Sources – stress on alternative energy sources and ensuring that use of machinery does not harm soil
12. Harvesting practices – follow traditional practices and ensure no mixing of harvested produce with chemicals and minimize exposure to fungal and insect attacks; care taken to see that crop stubble is used as manure or for mulching.
13. Animal management and animal husbandry – stress on local breeds with concern for animal's welfare and health; organic feeds are encouraged for animals and so is natural breeding.
14. Storage and Handling of organic produce – norms for packaging in bio-degradable, re-usable, re-cyclable material.

Records Keeping and Documentation

- All farm operations should comply with the Internal Regulations of the MYKAPS ICS.
- A daily record or cultivation record of the organic farm must be maintained giving details of types of work and area where work is done with relation to farm map.
- Farm map must indicate areas of agricultural fields, denoting their specific names which will be referred to in all records thereafter by that given name. Boundaries, building, pumps and other special features should be marked.
- A list of tools, machinery and livestock shall be maintained an updated as and when necessary.
- A crop plan should be made annually or seasonally with an end of year assessment by the farmer and family.
- A record of harvest volumes, processed volumes and sale volumes shall be maintained and submitted to MYKAPS every growing season.

Internal Regulation on Record Keeping in MYKAPS ICS

MYKAPS farmers are required to keep a day book or farm diary to record all kinds of activities and observations relating to cultivation of their fields. Each farmer is required to attend record keeping workshops held by the MYKAPS.

- This day book will be checked on weekly basis by the village nodal person who will help the farmer learn the process or record keeping and thus create a living history of the farming family experience for future reference.
- The MYKAPS ICS will assign graders to visit farmer's fields and verify their records on a regular basis, this sometimes may mean they will do a grading on a harvested crop.
- The MYKAPS ICS lead farmers (Vivek and Julie Cariyappa) and office bearers of the managing committee will visit farms at least twice a year to ensure IRs are being understood and carried out properly.

The ICS also has internal regulations on practices in particular crops grown in the area – Cotton, Paddy, Sugarcane, Vegetables and Horticulture. It also has Internal Regulations on management of plastic, harvest & storage and grading

Annexure 2e

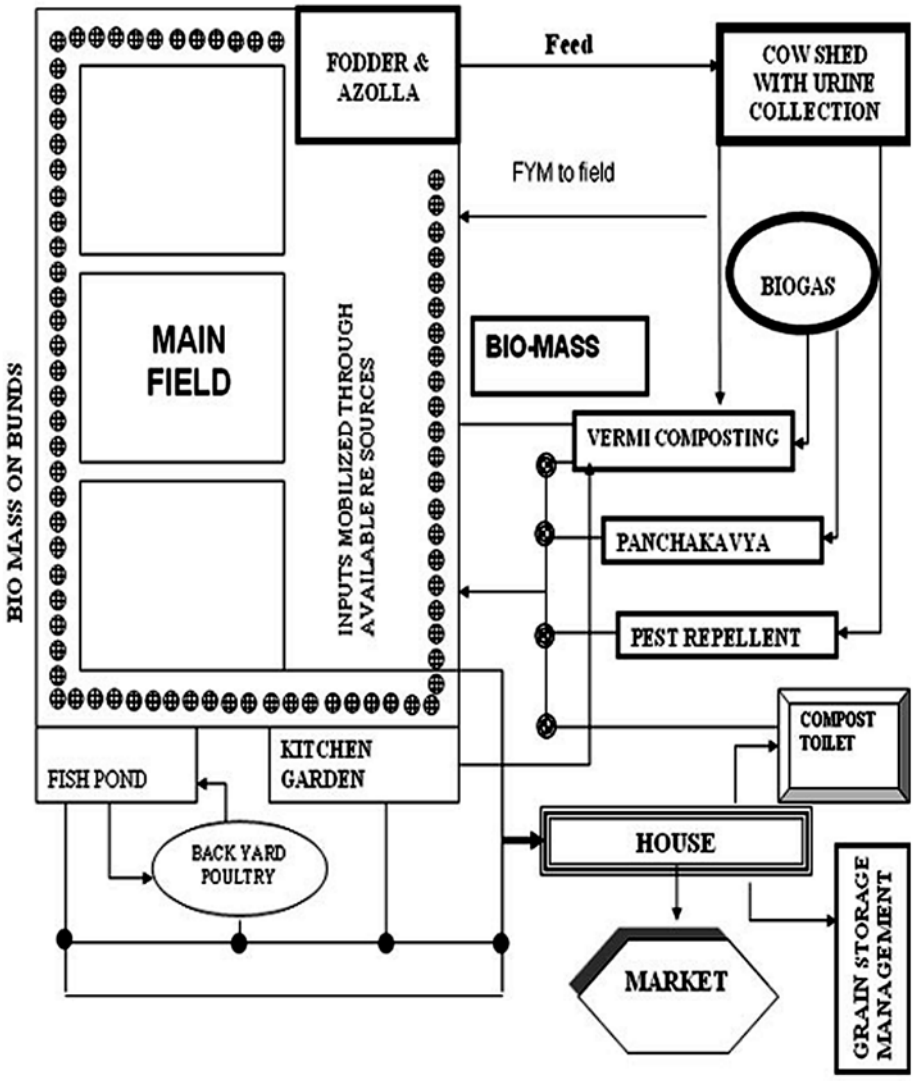
Description of IFD components and Layout of an IFD Model

Description of IFD Components

1. Cowshed with urine collection pit – The cows have safe shelter and the urine collected in the pit behind the shed is used for application in the field as it has good nutrient value
2. Bio-gas – a drum kit which facilitates the use of cow dung to produce gas which is used for cooking
3. Vermicompost - Vermicompost is a simple and easily adoptable biotechnology for decomposting a wide range of organic waste into good quality compost in a short period of time. It is prepared with the help of some surface dwelling earthworms and is nutritionally rich
4. Rainwater harvesting - Rainwater harvesting is a way to capture the rainwater when it rains, store it above ground or charge the underground and use it later.
5. Ecosan Toilets – ecological sanitation toilets are dry toilets with systems for dry and sanitary disposal of human urine and fecal matter, which is then converted to dry odourless manure than can be used on the farm.
6. Green Fodder – promotion of fodder on bunds and azolla to enhance milk promotion in animals.
7. Panchagavya (Bio growth promoter) – Organic formulation containing products of the cow such as milk, ghee, curds and other products such as jaggery, sugarcane juice, coconut water, etc.
8. The Crop Pest Repellent is the botanical extract that prevents insect damage to plants by rendering them unattractive, unpalatable or offensive. It refers to fermented plant extract, which ward off insects in order to prevent insect damage and loss to the crop.
9. On-bund biomass - Biomass or on bund biomass is the quantity or weight of living material that exists in a particular area, including leaf matter, fuel and fodder. In recent scenario high deforestation rate and reduced evergreen tree cultivation on farm boundaries leads to surface runoff which ultimately results in fertility loss and yield reduction on the other hand, rural poor have to depend almost entirely on forests and common land for their fuel wood and fodder supplies. Bund plantation helps the poor have access to fuel and fodder without having to destroy forests
10. Kitchen Garden – Kitchen gardens provide the poor with nutritious supply of vegetables and is an effective way of using space and organic wastes
11. Grain Storage – Promoted in order to minimize grain losses and preserve quality

Annexure 2f

Layout of an Integrated Farm Development Model



Source: http://www.Myradakvk.org/index.php?option=com_content&view=article&id=18&Itemid=16&lang=en

Annexure 2g

Extract from a Farmer's Diary in HD Kote

date	crop	activity	exp particulars
1-Jan-08	horse gram	threshing	Cost of labour @ Rs. 50 x 5 persons
2-Jan-08	horse gram	winnowing	Cost of labour @ Rs. 50 x 2 persons
3-Jan-08	horse gram	threshing	Cost of labour @ Rs. 50 x 3 persons
4-Jan-08	lab lab	taking out teralu (weeding)	
5-Jan-08	lab lab	taking out teralu (weeding)	
6-Jan-08	lab lab	minor activities	Cost of labour @ Rs. 50 x 1 person
7-Jan-08	holiday	festival	
8-Jan-08	holiday	festival	
9-Jan-08	holiday	festival	
10-Jan-08	holiday	festival	
11-Jan-08	holiday	festival	
12-Jan-08	holiday	festival	
13-Jan-08	holiday	festival	
14-Jan-08	holiday	festival	
15-Jan-08		SKS meeting	
16-Jan-08	lab lab	teralannu horuvudu	Cost of labour @ Rs. 50 x 2 persons
17-Jan-08	lab lab	teralannu horuvudu	Cost of labour @ Rs. 50 x 2 persons
18-Jan-08	lab lab	teralannu horuvudu	Cost of labour @ Rs. 50 x 3 persons
19-Jan-08	lab lab	teralannu horuvudu	Cost of labour @ Rs. 50 x 1 person
20-Jan-08		preparing the storage area	Cost of labour @ Rs. 50 x 2 persons

21-Jan-08	lab lab	minor activities	Cost of labour @ Rs. 50 x 6 persons
22-Jan-08		preparing the storage	Cost of labour @ Rs. 50 x 4 persons
23-Jan-08		mulching	Cost of labour @ Rs. 30 x 2 persons
24-Jan-08	mango	Application of fertiliser to mango trees (melavannu kochuvadu?)	Cost of labour @ Rs. 30 x 4 persons
25-Jan-08		fencing of mango trees	Cost of labour @ Rs. 30 x 2 persons
26-Jan-08		fencing of trees	Cost of labour @ Rs. 30 x 3 persons
27-Jan-08		watering trees	Cost of labour @ Rs. 25 x 2 persons
28-Jan-08		watering trees	Cost of labour @ Rs. 25 x 2 persons
29-Jan-08		pitting	Cost of labour @ Rs. 30 x 5 persons
30-Jan-08	lab lab	peeling	Cost of labour @ Rs. 30 x 3 persons
31-Jan-08	lab lab	peeling and watering of trees	Cost of labour @ Rs. 40 x 4 persons
1-Feb-08	ragi	preparation of ragi fodder stalk	Cost of labour @ Rs. 50 x 5 persons
2-Feb-08		preparing the storage	Cost of labour @ Rs. 50 x 3 persons
3-Feb-08		preparation of storage	Cost of labour @ Rs. 50 x 2 persons
4-Feb-08		preparation of storage	Cost of labour @ Rs. 50 x 4 persons
5-Feb-08	ragi	(not clear)	Cost of labour @ Rs. 50 x 7 persons
6-Feb-08	ragi	winnowing	Cost of labour @ Rs. 100 x 7 persons

7-Feb-08	ragi	Winnowing of ragi and pooja done - yield 25 bags of ragi	Cost of labour @ Rs. 100 x 6 persons
8-Feb-08	ragi	transporting ragi bags from field to house	Cost of labour @ Rs. 100 x 6 persons
9-Feb-08		laying foundation for vermicompost pit	Cost of labour @ Rs. 60 x 2 persons
10-Feb-08		laying foundation for vermicompost pit	Cost of labour @ Rs. 65 x 1 person
11-Feb-08		putting jelly for VC	Cost of labour @ Rs. 50 x 2 persons
12-Feb-08		plucking of tamarind and transporting it home	Cost of labour @ Rs. 50 x 9 persons
13-Feb-08		ploughing	Cost of labour @ Rs. 100 x 2 persons
14-Feb-08	lab lab	sale of lab lab - Income received - Rs.3450/-	
15-Feb-08		laying furrows in the field	Cost of labour @ Rs. 50 x 2 persons
16-Feb-08		building furrows in the field	Cost of labour @ Rs. 50 x 2 persons
17-Feb-08		minor activities	
18-Feb-08		Holiday - jatre	
19-Feb-08		Holiday - jatre	
20-Feb-08		Holiday - jatre	
21-Feb-08		(not clear)	labour
22-Feb-08		excess rain - no work in field	
23-Feb-08		excess rain - no work in field	
24-Feb-08		Digging of pond	labour
25-Feb-08		Holiday - sick	

MYRADA's Publications

Manuals/Books

1. Participatory Impact Monitoring of SHGs & Watersheds
2. The Myrada Experience - People's Institutions for Sustained & Equitable Management of Micro Watersheds (July 16, 1993)
3. The Myrada Experience - People's Institutions Managing Natural Resources in context of a Watersheds Strategy (Sept 2003)
4. The Myrada Experience A Manual for Capacity Building of People's Managing Watersheds (31st March 2004)

Rural Management System Papers

1. PIDOW – Towards a PIDOW Model (Paper 4)
2. Mini Watershed Management Systems (Paper 5)
3. The "P" In PIDOW (Paper 6)
4. The Question of Equity in Watershed Management (Paper 20)
5. A participatory Approach to Watershed Management (Paper 24)
6. Watershed Management – Are Loans More Effective in Promoting Participation and Ownership Than Contribution? The Roles of Panchayat Raj Institutions. (Paper 36)
7. Participation and Integration in Watershed Management Strategy in GOI and GOK programmes (Paper 37)

Before

After