

Anecdotes from the Field



Photo. Vaibhav Bhatia.

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Strengthening Institutions

Building Institutions for Pasture Land Development

A Case Study from Sooliya, Bhilwara

Sooliya, a village located in Goverdhanpura Panchayat in Mandal tehsil of Bhilwara district has 356 households inhabited primarily by the Gujjars (the dominant caste), Balais, Nathas, Bheels and Khatiks. Agriculture and animal husbandry are the primary source of livelihoods; however, recurring droughts have led to a severe decline in the productivity of the rural production systems, forcing people to migrate to nearby areas as well as other states like Gujarat and Maharashtra.

The village had 650 bighas of pasture land or *charagah* which was traditionally protected through collective norms of governance. While the village had used Panchayat funds to regenerate 40 bighas, the weakening of the institutional fabric resulted in a situation where the *charagah* became open access and the adjoining villages of Roopura and Raghunathpura also put forward their claims over it. Another consequence of the institutional breakdown was the heavily politicized caste conflict between the Gujjars and Balais, which further posed a challenge to collective action in the village.

However, the deteriorating state of livelihoods in Sooliya prompted the village community to come together for village development. With the introduction of MGNREGS, the people saw the opportunity to develop pasture land. It approached the adjoining village institutions of Bagjana, Garwai, Kangsaka badia, Roopura where FES was working on pasture land development. On the suggestion of the local federation of these 4 villages, a Charagah Vikas Samiti was formed in Sooliya in 2008. The community now pays a *chaukidar* a sum of Rs 3000 per month for guarding the resource. The village institution charges a nominal amount of Rs. 5 per animal for grazing. The village contributes in both cash and kind to manage the pasture land and other collective expenses.

The Samiti submitted a proposal to the Goverdhanpura Panchayat for the development of 250 bighas of pasture land. However, the conflict over pasture land with Roopura and Raghunathpura was proving to be a hindrance. The members of village

institutions requested both the Gram Panchayats to look into the matter while the Patwaris of both Goverdhanpura and Gyangarh demarcated the land. However, due to the adamancy of the Roopura and Raghunathpura villages, the matter was referred to the Sub Divisional Magistrate who resolved the issue as per the old records. Once the boundary issue was resolved, the villages undertook activities such as cattle protection trenching, stone wall fencing, continuous contouring trenching, pitting and planting of 10000 saplings of *Acacia nilotica*, and *Acacia leucopholea* under MGNREGA.

The case of Sooliya clearly elucidates the significance of village institutions in resolving conflicts, both internal and external, and managing and developing common pool resources.

Restoring forest land through up-scaling and convergence

A case from Barundani Village

A part of the state of Udaipur in the past, Barundani today is a Panchayat in Mandalgarh tehsil of Bhilwara district. A large village, with a population of over 6000 persons, the village also functions as a local trade centre. There are stark differences in the socio-economic and political status between the main village, dominated by the well-off upper caste Brahmins, Banias and Rajputs, and its peripheral habitations, chiefly occupied by the small and marginal farmers largely from Meenas, Gawarias, Gadris, Muslims etc.

Against this backdrop, ecological restoration seemed to be an uphill task in Barundani, a village in the cluster which had been finalized for project implementation in 1995. It was only through sustained engagement for building cohesive village level institutions over a period of one year that restoration activities could be initiated in the Panchayat. Meanwhile, the creation of a Tree Growers' Cooperative Society (TGCS) in Damangatti, a revenue village of Barundani Panchayat, and the subsequent allotment of 33.5 ha of non-agricultural revenue wasteland to it by the District Collector further encouraged other habitations in the Panchayat as well and hastened institutional processes.

The assistance of FES was sought for the creation of the Village Forest Protection Management Committees (VFPMC) in four habitations, namely, Gadri Kheda, Meena ki Jhopriya, Nalai ka Kua and Talai ka Jhopada, and for an agreement with the forest department to restore 200 ha of degraded forest land under Joint Forest Management (JFM). It was only through persistent engagement by the community, Panchayat members, federations and FES that the forest department agreed to the arrangement.

In addition to working on these JFM plots for regeneration, the institutions also undertook soil and moisture conservation activities on the land, complemented by planting on 25000 saplings and seedlings of fodder seeds. Further, 6.5 km of drainage line was treated with the construction of 17 small water harvesting structures. These efforts helped in the consolidation of community governance over these and adjoin-

ing common lands. Effective planning and implementation on these lands helped in regeneration of the resource and benefits for the poor and marginalized sections.

Inspired by the success of the VFPMCs, recently, six other village institutions were formed. Having secured permission to restore 300 ha of forest land, these villages then leveraged MGNREGA for restoration activities. The benefits of these activities accrued not only in terms of increased fodder availability but also the revitalized water and nutrients cycle, reflected in the recharge of the wells in downstream lands.

These biophysical interventions were complemented by innovative governance mechanisms; the village tank, for instance, could no longer be used for irrigation and was reserved for drinking requirements of people and livestock. The communities have also come together to form a Mahasabha or a federation at the watershed level, in the nature of the Paryavarn Premi Samaj, a federation of villages working on natural resource management in Mandalgarh tehsil.

Thus the journey that began in one revenue village has upscaled to cover 600 ha of degraded forest land through the convergence of JFM and MGNREGA; efforts on this land are not only increasing the forest cover but also contributing to the restoration of forest-water linkages at the landscape level.

Institutions bringing socio-economic change

The case from Manoharpura village, Bhilwara

Manahorapura village in Nimba hera Jatan Panchayat, has around 120 households, the dominant populations being Rajputs, Brahmins, Regers, Balais, Bheels and Naths. As a part of its efforts towards pasture land development, the village also formed a Charagah Vikas Samiti. The institution made efforts to generate awareness on the importance of the *charagah* for rural livelihoods, as a result of which some encroachments on it were removed and the boundary was demarcated. At the same time, byelaws were formed for better management of the resource.

A remarkable change brought about by the decision-making processes established by the institution is that the Rajput women who never attended any public meeting or gathering in the village now participate actively in it. While some women done physical work on the plot, a few have also been trained as Rural Volunteers.

The institution has also leveraged MGNREGA to undertake pasture land development activities on 40 ha of land. As a result, the Kalbeliya community in the village, which migrated to other towns and nearby states in the distress months of May and June, found wage employment in the village itself. Some say that after this, the instances of alms-seeking in the village by the Kalbeliyas have also reduced.

Collective Action for Governance of Common Resources

Learning from Chakuria Village

Chakuria village in the Batagaon Gram Panchayat of Kankadahad block in Dhenkanal district is predominantly inhabited by the Munda tribes. Wage and Non Timber Forest produce (NTFP) are the main sources of subsistence for the Mundas. However, an increasing number of families have been migrating to nearby towns during the stress period (January to May) in recent years as a result of the dwindling forest resource and non availability of labour in the village throughout the year.

It was in this context that FES initiated the process of strengthening community institutions for natural resource management. Village specific byelaws were prepared with reference to the existing rules. Further, in consultation with all the members of the community, the village perspective plan was prepared in order to identify the major issues of the village and outline the possible ways of improving the situation. The village agreed to contribute labour as and when required to fulfil their perspective plan.

The discussions and consultations of the community revealed that low levels of income and migration were the most critical problems in the village. As a result, the village decided to initiate the process of community farming on 2 hectares of land. All the 30 households contributed to vegetable cultivation on one third of an acre and each household received 80 kg of potatoes and 8 kg of radish. However, due to the lack of irrigation facilities, the village could not expand the area under community farming.

On being requested by the village institution, FES provided a diesel pump and a vegetable seed kit. It was decided that the pump would be used only for community farming and could be given to an individual household for its kitchen garden when not in use on the community farm for a nominal fee. However, if it was rented out to another village, FES could withdraw the pump from the community.

This enabled the community to undertake cultivation of potatoes, radish, brinjal, French beans, okhra, tomato and bitter gourd on an acre of land. This land was protected by community fencing and strict rules were framed to control open grazing. These efforts have given the village a return of Rs. 15980 from the common plot and Rs 300 as pump charge from individual households who borrowed the pump. A study of the impact of the initiative showed that households which cultivated vegetable crop individually by using the diesel pump also secured an income of Rs. 12715 in the 2010-11. The village now plans to create a Grain Gola and seed bank.

Coming Together for Community Farming

The Experience of Hinsalai

Hinsalai, a village populated entirely by Kondh tribals, is situated in Ganjada watershed, at a distance of 45 km from the district headquarters of 45 km. Most of the 16 households in the village have marginal landholdings but the main source of their income is daily wage labour. All the families belong to the Below Poverty Line (BPL) category and the average annual income of the families are around Rs. 5000- 7000.

The total agricultural land in the village is around 29 acres, all of which is located around the three private wells constructed under the government scheme (25 ft depth and 10 ft diameter) and a common well. The village is also extremely dependent on common pool resources in the village for their requirements. The people depend on a nearby *nala* for daily activities like bathing, washing etc. The village together protects a patch of forest near the village and is united for common village ac-



activities like maintenance of the community hall, village fund and other aspects of social life.

During the household survey and through several interactions with the community, the lack of irrigation facilities was found to be a major problem for undertaking farming. Discussions indicated that most people would be willing to undertake vegetable cultivation if they are provided with a pump that helps them in lifting water from the wells. Following this, the strengths of the community were assessed in this regard. It was found that the three wells in the community have substantial water throughout the year and the hydro-geological conditions were favourable. Working

as agricultural labour in nearby villages, the people had experience in cultivating vegetables and the village had an institution to manage the use of the pump at the community level. Market access was also possible since the vendors themselves come to the village to procure the produce and a weekly market (*haat*) is held in Dandasingha, one of the nearest villages.



Collectively, the village decided that the persons on whose plot the wells are situated would provide water to the others for farming but the cost of fuel and maintenance would be borne by the concerned farmer who would use the pump. At first, all

households would cultivate crops which require less water like ladyfinger, cucumber, pumpkin, maize etc on the same amount of land and the entire cultivation would take place on a consolidated patch of land for optimum use of water.



The community was provided with a 1.5 hp diesel pump in 2009-10, which helped them in cultivating vegetable crops in the *rabi* season. Since this was the first attempt, the community was also supported with better quality vegetable seeds (okhra, tomato, radish, maize, french beans, spinach, chilli and brinjal). Previously, only a few families were involved in

kitchen gardening, but the number of such households expanded considerably after this intervention. They not only cultivated vegetables for which seeds were provided by FES but also others like cabbage, potato, onion and garlic. The yield was high and was used primarily for household cultivation, with the surplus being sold in *haats*.

In 2010-11, as a result of water shortage, fewer vegetables were cultivated. The major crops were paddy, potato and garlic, while brinjal, tomato, maize, cabbage and cauliflower were cultivated on a small area of land. The yield was used entirely for household consumption. The households claim that after this intervention they consumed vegetables regularly for three months of the year.

Strengthening Livelihoods



Building Rural Infrastructure *A Case from Kumuri village, Angul*



Kumuri watershed is located 58 km away from the district headquarters of Angul district in Odisha. Adjoining the Satkosia Gorge Wild Life Sanctuary, the watershed covers three revenue villages namely Kumuri, Sankrida and Tentulipada. Kumuri village is comprised of eighty households wherein 60% of the

population belongs to the category of Scheduled Tribe (ST). Most of the households in the village own small and marginal landholdings, and agriculture, along with NTFP and wage labour, constitute the chief sources of income in the area.

While the village had some customary rules of management of resources, they had deteriorated over time and there was discord among the villagers on the issues of village fund management, accountability, irregularity of meetings and domination of the decision-



making process by a committee of 11 members who were representatives of the ham-

lets. It was only after repeated attempts of FES that the whole village came together on a common platform and the process of strengthening the village institution could be initiated.

The institution, with the assistance of FES, has undertaken a series of eco-restoration measures such as construction of continuous contour trenches or staggered trenches depending on the slope, contour stone bunds, earthen dams and loose boulder check dams to help regulate velocity of runoff, avoid erosion of drains and build water storage capacity to meet domestic, agricultural and livestock water requirements. Apart from these, farm ponds and farm wells were also constructed on private lands. While local forest species were planted on the common lands, horticultural species were planted on the private lands in the uplands.

21 households were benefitted from farm bunding, 16 from water absorption trench and 4 from gully plugging structures. 1 acre of land received critical irrigation support from the percolation tank while 1.5 acre of uplands was brought under agriculture activities where 4 household cultivated beans, onion, potato, brinjal, wheat and garlic which were earlier lying fallow. A study conducted by FES shows that 261 cubic metre of soil was deposited in 15 stone gully plugging structures in the first year of its construction.

According to the community, as a result of these interventions, there has been an increase in soil deposition in the upstream side of the structures, improvement of soil moisture content, increased citing of pollinators like butterflies around the structures and longer duration of water flow in the streams.



Well Deepening

Cases from Bhilwara

In Kareda Panchayat, recurrent droughts have resulted in the drying up of wells and a fall in the level of groundwater by 12-15m. While the government provides external supplies of water during such periods, these are irregular and inadequate to meet people's domestic and production related water requirements. As a result, there is an increasing realisation among the villagers to develop internal resilience for such periods of stress. As a part of its efforts to mitigate the effects of droughts, FES initiated the well deepening project in Kareda in 2010 under the JTT-NABARD watershed programme. Under this project, one well located on common land was to be deepened in the villages of Kartha, Kerpur, Sanjadi ka badiya and Bagjana, selected on the criteria of urgent requirement. The initiative was successful in all villages, save for

The Case of Sanjadi ka Badiya

In Sanjadi Ka Badiya, well deepening was of critical importance in the area since the village did not even have enough drinking water for its residents, let alone other requirements. FES selected a well which was accessible to all the households and situated closest to the farm lands. Deepened by 8 feet, the well now remains filled with water throughout the year and provides for the domestic and livestock drinking requirements in the village. It also provides the farmers in the village with water for life-saving irrigation during *rabi*, thereby enabling people to increase the area under double crop.

The Case of Kerpura

The well in Kerpura, a hamlet of 7 households, held water only during the monsoons. Being adjacent to the hamlet, the villagers were dependent on the well for domestic and livestock drinking needs. The well deepening started with digging 2-4 ft deep. However, it was soon realized that the well would not be able to yield water and the effort was discontinued. This experience points to the fact that well deepening cannot be an exercise taken in isolation; it needs to be complemented by an understanding of the hydro-geological conditions and overall eco-restoration efforts.

Impact of Water Harvesting Structures

A case from Kalyanpura Watershed

Recurrent droughts created a situation of extreme distress in the Kalyanpura watershed area, bringing to light the urgent need to revitalize the natural resources, especially the traditional water harvesting structures, in the area to create a secure basis for the livelihoods in the area.

Over the two and half years that have followed, 12 water harvesting structures with a storage capacity of 107891 cubic metre have been constructed in the watershed under the Kalyanpura Public Private Partnership project. These structures have been instrumental in recharging 15 adjoining wells and directly supporting farmers in their command area by reducing their vulnerability to the fluctuations in rainfall. At the same time, the construction of these structures have generated approximately 11600 wage days for the villagers, especially the landless.

The case of Motilal Berwa

Motilala Berwa belongs to the habitation, Kalebliyo ka Dera, in Mukangarh village, a small village in Srinagar Panchayat under the Kalyanpura watershed. Mukangarh is underdeveloped compared to neighbouring villages and migration has become a common ohenomena among the Kalbeliya community, a Scheduled Tribe.

Motilal and his three brothers own about 2.5 ha of land in the command area of an anicut, a water harvesting structure, constructed under the watershed programme in Kalyanpura. Earlier, maize used to be the only crop cultivated on the land, while the land used to lie fallow during *rabi*. Three months before the construction of the anicut, the family had dug a sixty feet deep well in their farm. Initially, there was no water in the well. However, with the onset of monsoon and the construction of the anicut, the water column in the well began to increase. Soon after, they also purchased a diesel operated pump. In 2008, the family cultivated wheat for the first time on their land. Further, during the drought in 2009, the increased water levels in the well (20 feet in the post monsoon period) helped the family to irrigate their fields both in the *kharif* and *rabi* season. While there was no surplus for sale in the market, it was enough to meet the subsistence requirements of the family.

Strengthening Livelihoods by Strengthening the Commons

The Role of MGNREGA in Dasarhalli, Chintamani

In Dasarhalli village in Thimmanayakanhalli Grama Panchayat in Siddlaghatta taluka, a single family owns 150 acres while the remaining households own only 50 acres of land. Further, in the absence of adequate irrigation facilities, most of the households are able to raise only one crop. In other parts of the year, they either work in nearby villages or in Chintamani and Siddlaghatta, the nearest towns for daily wages. Till a few years back, the wages for men and women in the village, when work was available, were Rs. 60-70 and Rs. 20-30, respectively.

Thus when MGNREGA was initiated in the district 2008, it provided an opportunity to improve the livelihoods of the people in the area. However, there was a serious lack of awareness regarding the provisions and potential of the Act among the administration and the people. It was in such a context that FES started working with this village. A series of meetings and awareness programmes were held in the village to disseminate information the people regarding their entitlements under MGNREGA. The youth was motivated to take the lead in this and Prasad, the local waterman, ensured that the 40 households got job cards.

In 2008-09, the desilting and repair of the Mallikunte tank was undertaken using the funds available under MGNREGA, the first in the Thimmanayakanhalli Grama Panchayat. There was resistance from several quarters against this development; while the Panchayat Secretary was resisting it due to the increased work load, the big farmers resented the high wages being paid to the labourers under the programme. The delay in the making of the estimation by the department engineer also delayed the process. However, the people persisted and eventually, despite the extreme weather, the work was initiated.

Even though the work was not completed that year, 15-20 households have benefitted from increase water flow into their fields, enabling them to cultivate paddy even during *rabi*. The activity generated a total of Rs. 13776 as wages but there were delays in payment; the team worked to address this at various levels and while it succeeded in

getting the wages released to the workers, it dampened the enthusiasm of the people towards the programme. The team also helped in facilitating the formation of Vigilance and Monitoring Committee at the village level but due to very limited or no power allocation it has not played any role at all.

In 2010-11, the desilting of tank was completed and a cattle pond has also been constructed, thereby creating a stable water source for livestock. Almost 767 person days of work was generated with total labour payment of Rs 62,971. With wages hiked to Rs 125 under MGNREGA, short duration migration has come down to some extent and people have more options during the lean season. And while challenges remain, FES, along with the people, is persisting in its efforts to ensure the proper implementation of the programme.

Farm Land Interventions

Strengthening Livelihoods in Achlaji ka Khera

Under the ongoing watershed project, a key focus has been to enhance the farm-based production systems. The story of Jeetmal Mangna Gujjar, a farmer belonging to Achlaji ka Khera, a small village of eighty households in Mandalgarh Tehsil of Bhilwara district, captures the impact of these interventions.

Jeetmal Mangna Gujjar owns 2.4 ha of farmland adjacent to a '*khaal*' (drainage line). Steep slope of the land and heavy flow of water along this drainage line has led to the erosion of the productive soil on his farmland. The eighty feet well on the land also dried up during the *rabi* season. The family had constructed a '*naadi*' (a small earthen water harvesting structure) on the main drain but it had been rendered redundant due to the lack of resources to maintain it. Thus, the area under cultivation and its productivity were lower than its actual potential.

Through technical and financial support under the watershed project, the *naadi* was repaired in March 2010. Jeetmal Gujjar contributed 15% of the money invested and deepened his well by ten feet. Awareness efforts on the part of the village institution and FES motivated him to initiate land leveling and farm bunding. He planted 250 saplings of '*karaunda*' on the bunds, of which 60% have survived. Encouraged by the results of these efforts, he also constructed a loose boulder check dam across the drainage line at his own expense to regulate the flow of water. Following him, many other farmers in the village have also undertaken soil and water conservation measures on their lands.

As a result of these interventions, the water level in his well has increased substantially and he has been able to bring around 0.4 ha of his land, which had been lying fallow for many years, under cultivation. Even during *rabi*, he cultivated his entire land, with wheat on 2 ha and *masoor*, *tara mira* and *rajka* on the remaining 0.4 ha of land. The yield was almost six times the earlier yield and he managed to earn close to Rs. 4000 from the sale of surplus. The increase in the cropped area also led to an assured source of fodder in the form of crop residue. This prompted him to purchase two buffaloes and at present, he sells 1l of milk per day to the village dairy, which fetches him a monthly income of Rs. 2500.

Promoting Water Efficient Crops

The case of Amrita wheat in Kalyanpura

Bhilwara district is suffering from an acute scarcity of water, especially for agriculture. While the scientific community has long suggested a shift in crops cultivated, in the absence of alternatives, the farming community is forced to take up crops with low local food or fodder value or leave the land fallow. There is a pressing need to promote crops that require low external inputs through institutional support.

In line with this need, FES initiated efforts to promote water efficient wheat crop in the Kalyanpura watershed area. With the technical support of Maharana Pratap University of Agriculture and Technology, Udaipur, crop demonstration of HI 1500 (*Amrita*) variety of wheat was taken up with 4 farmers this year. The inputs were distributed through the village institutions.

A comparative analysis of the costs incurred in cultivating the *Lokwan* and *Amrita* variety of wheat shows that the latter requires only half the quantity of the water required by the former. This not only reduces irrigation expenses for farmers but also gives an opportunity to cultivate wheat to those farmers who left their land fallow during *rabi* due to water scarcity. The over-irrigation of the *Amrita* variety led to loss of production and lower yields compared to *Lokwan*. However, the fodder produced per *bigha* in the case of the *Amrita* variety is almost fifty quintals per hectare as compared with *Lokwan* which produced thirty quintals per *bigha*, highlighting the value of the former for livestock. The cultivation of *Amrita* also involved lower per hectare costs of DAP, urea, and threshing, while the cost of seeds, sowing and harvesting were the same.

The institutional arrangements in the area have helped in the strengthening the local seed pool for the future. Linking of village institutions with research stations has enhanced the possibility of dynamic crop planning to adapt to the erratic climatic conditions. Promoting such crops must be seen as a necessary step towards revival of locally suited and appropriate farming systems.

Promoting Organic Farming Practices in Bhilwara

Kashibai's family grows sugarcane, chili, lentils like *masoor*, wheat, and seasonal vegetables on the 15 bigha land that it owns. While the sugarcane is grown for the market, part of the wheat is kept for self-consumption. Lentils and vegetables and chilies are grown purely for self-consumption.

However, the farming practices are different from those that existed in her childhood. As a child, Kashibai, now 45 years of age, had seen her father use '*desi khad*' (farmyard manure) in their fields. However, now farmyard manure has been replaced to a large extent by chemical fertilizers and pesticides procured from the market. Further, production is geared mostly towards the market rather than self-consumption.

Kashibai attributes the decline in soil quality as well as in the nutritional value and taste of the crops produced to the excessive application of chemical fertilizers and pesticides. While she admits that production has increased, she also states that there is hardly any crop residue for fodder now. Thus when the opportunity presented itself, Kashibai decided to go back to organic farming.

Of the 15 bighas of land, the family has cultivated wheat on one bigha. While the production in the first year was low, they managed to save 10 kg of seeds, 40 kg of urea and 10 kg or DAP. Kashibai claims that despite the loss of production that they would have to suffer in the initial years, she is optimistic about receiving higher returns in the long run.

Technological Interventions for Improved Livelihoods

The Case of Pedal Pumps in Angul

In the watershed area in Angul, there are a large number of small landholding households. Unable to invest in mechanization on their land, FES provided pedal pumps, low-cost water-lifting device which requires foot operation to lift water from a well, to these households for the purpose of micro-irrigation. Procured from International Development Enterprises, India, a total of 14 pedal pumps have been installed in 8 villages, benefitting 60 people in all.

These pedal pumps have replaced the traditional water lifting device locally known as *tenda* since it requires less effort to lift water compared to a *tenda*, are easy to operate, can be used by any age group, and being light-weights, can be easily transferred from one place to another. Irrigation from these pumps has helped in bringing some more land under cultivation. It has especially supported the kitchen gardens of small landholding households, the vegetables cultivated on which were used for subsistence and, if surplus, for sale.

In Kumuri village, the pedal pump enabled four households to undertake cultivation of beans, onion, brinjal and garlic on a total of 1.5 acre of farm land in the uplands, lying fallow earlier. In Olaberi, micro-irrigation through the pedal pump enabled five families to extend the area under vegetable cultivation and secure returns from their sale. Similarly, in Badataila village, Tara Behera, a widow, who was unable to cultivate the 1.5 acres of land she owned due to her physical condition, was given a pedal pump after discussions at the village level. She now uses the pump to cultivate vegetables like brinjal, okhra, onion and leafy vegetables in her backyard.



Promoting Millet Cultivation in Dryland Farming Systems

A Case from Madanapalle

Burujupalle is a small habitation of Zunzurupenta Gram Panchayat in Mula-kalachereuvu Mandal of Chittoor district of Andhra Pradesh. Cultivation of traditional millets disappeared many years ago due to the invasion by commercial crops like groundnut, tomato and sunflower. In recent years, recurrent droughts and inappropriate land management practices have led to a decrease in soil fertility and crop productivity. This has compelled farmers to invest more in agricultural inputs such as seeds, fertilizers and pesticides, while some have abandoned agriculture entirely. In order to address the crisis, FES made efforts to assist the community in reviving millet-based farming on a pilot basis.

As a part of this endeavour, FES organized Kalajatha in five villages on 'the present crisis in agriculture vis-a-vis the importance of millets in dryland farming systems'.

The response of the villages towards taking up the cultivation of millets varied, but the farmers of Burujupalle showed enormous interest in the experiment of revitalizing millet cultivation within the existing farming system. An



exposure visit was organised for these farmers to Muddanur village near Pulivendula of Kadapa district where foxtail millet is being cultivated on a large scale for the past several years.

After discussions, a total of 37 farmers came forward to cultivate six varieties of millets, namely, pearl millet, foxtail millet, little millet, kodo millet, finger millet and proso millet. The seeds of these millets were given to these farmers through the vil-

lage institution. The FES team also organised training on sustainable agricultural practices for the farmers and the latter were also given bio-fertilizers and on-farm technical support through Para-Workers. At the end of the season in 2011, a total of 47.5 acres was brought under millet cultivation. The net returns of pearl millet and foxtail millet were found to be much higher than groundnut (Table 1).

Table 1: Net returns from cultivation of groundnut, pearl millet and foxtail millet

Parameters	Groundnut	Pearl Millet	Foxtail Millet
Cost of production (Rs./acre)	7660	2310	1875
Main crop yield (q/acre)	1.58	7.65	11.46
Gross returns (Rs./acre)	9286	14564	17525
Net Returns (Rs./acre)	1626	12254	15650

At the end of the season, a field day was organized in September 2011 to share the experiences and learnings with the fellow farmers. 60 farmers and many officials from the



District Department of Agriculture attended the event, visited the fields where millet were still standing high and tall, and also witnessed the exhibition arranged to show case the efforts of reviving millet cultivation. After seeing the crop on the field and understanding the related economics, some farmers

from the neighbouring villages have expressed their keenness on taking up millet cultivation in the coming season of 2012. We are also planning to assist the community in establishing a seed bank for millets in the near future.

Sustainable Rice Intensification in Andhra Pradesh

As a result of adverse weather conditions and increasing input costs, present day farming practices with an undue reliance on chemicals are becoming increasingly unviable. Therefore, under the component of enhancing productivity in the watershed project, the Madanapalle team has been actively promoting the System of Rice Intensification (SRI), an alternative method of rice cultivation which requires less input and gives higher yields. The team has undertaken awareness programmes, motivated farmers through study tours and built their capacity through trainings and on-farm guidance. This has been complemented by encouraging in situ soil moisture conservation, regeneration and recycling of biomass for improving soil fertility and crop management practices in dryland crops.

Economics of Sustainable Rice Intensification

Parameters	SRI Paddy (1 Acre)	Normal Paddy (1 Acre)
Seed Rate	2	30
Age of the seedlings	12 days	28 days
Avg no of Tillers / clump	38	19
Avg no of Productivity Tillers /clump	38	10
Gain yield (q/acre)	4.04	2.42
Fodder Yield (q/acre)	6.90	6.04

Shri Srinivasulu Reddy of Mundlavaripalle village, 15 km away from Kadiri town, owns three acres of land on which he cultivates groundnut, sunflower, tomato and paddy. He has been using Low External Input and Sustainable Agriculture (LEISA) practices for a few years, as a result of which there has been a significant improvement in the groundnut yields. Once the watershed project was sanctioned, Srinivasulu capitalized on this experience and up-scaled paddy cultivation by adopting SRI practices coupled with those of Integrated Nutrition Management and Integrated Pest Management.

Integrating Farm Ponds into the Dryland Farming Systems

Cases from Chittoor

In 2005, the District Administration of Chittoor invited FES to participate in the implementation of the Food Assurance Programme (FAP) through the construction of farm ponds in the private lands lying in the area between ridges and lowlands in three mandals, namely, Thamballapalle, Peddamandem and Mulkalacheruvu. These areas are recharge zones characterized by undulating terrain, sparse vegetation and low productivity, and they are usually owned by the poor and marginal farmers. FAP was, therefore, an opportunity to hold the run-off in this area and thereby improve the moisture regime, biomass availability, recharge of open wells and bore wells, and options for crop selection.

Under the programme, interested landowners brought the workers to construct farm ponds on their land while the government and FES shared the costs. The government contributed towards the rice and cash components (amounting to 88% of total expenditure) and FES had the responsibility of contributing towards the material cost component, including purchase and transport of stones for pitching inlet and outlet of the farm ponds (12%). Each worker received Rs 80 for digging one cubic metre which was divided into 20% (Rs 16) cash and 80% (8 kg) rice while the cost of each farm pond varied by size (Rs. 10000 for an 8x8m, Rs. 12000-13000 for 10x10 m, and Rs. 15000-18000 for 12x12m). While FES was given the order to construct ponds in 12 out of 24 villages, the Panchayati Raj Department was to implement it in the remaining 12 villages.

FES discussed the project with the villages in which it worked and facilitated, with the consent of the households, the formation of a list of villages where farm ponds could be constructed as well as an estimate of the number of such ponds that could be constructed. Senior members of these villages were taken for an exposure visit to Tiptur, Karnataka where the BAIF Institute for Rural Development, Karnataka had constructed and interlinked farm ponds in their project areas. Resolutions were passed in Thamballapalle and Mulkalacheruvu areas by the village institutions ap-

proving the construction of farm ponds in their respective hamlets and interested farmers filled individual declaration forms.

In keeping with the ridge to valley approach, the farm ponds were constructed at sites which fell in the course of natural drainage. The inlet of the ponds had silt traps to prevent siltation of the ponds while revetment was done to maintain the structure of the pond. The landowners were also encouraged to plant fodder grass or trees on the pond bunds to help improve the organic content in the soil, prevent erosion and the associated run-offs. A total of 343 farm ponds, benefitting 338 farmers, were constructed in 40 habitations in the three mandals mentioned above. The target of 547 could not be met due to early monsoon which resulted in the initiation of intensive agriculture activity. Thus, against a budget of Rs. 57 lakhs, the team could utilize Rs. 30.75 lakhs, of which Rs. 3.15 lakhs were contributed by FES to meet the material cost component.

The Impact

The farm ponds thus constructed have been extremely successful in creating a micro-catchment around themselves and in maintaining the soil moisture conditions; they hold water throughout the year, with April and May being the only dry months. They have helped in increasing the yields in the adjoining area through life-saving irrigation. Many farmers have also sown vegetables, horticultural plants, fodder grass, fodder trees and others on the bunds of the farm ponds. It is notable that while the ponds were constructed on individual plots, the water harvested in these ponds was not only used exclusively by the landowner but owners of neighbouring farm plots could use the ponds



for purposes of domestic consumption and as drinking water for livestock. The programme was also successful in its objective of providing wage employment to people in a period of critical employment period by creating 30,162 man-days across all the Mandals under the project area. The payment of wages and the distribution of food coupons were undertaken promptly by both FES and the Panchayati Raj Department, unprecedented for the people in the area.

However, despite the success of this effort, serious challenges are posed by the proliferation of borewells and the consequent neglect of farm ponds. However, there exists tremendous scope for saturating the marginal agricultural lands with such ponds and for inter-linking them.

Stories from Chetlavaripalle

In Chetlavaripalle, a village in Thambalapalle mandal, R. Venkataramana Reddy, uses the water from the farm pond on his land (8x8x2) to cultivate tomato in both, the kharif and the rabi season. At the same time, the water was also used by the stone-cutting labour nearby to meet basic requirements. In the same village, 5 farmers together cultivate tomato 2.5 acres of land in both the main agricultural seasons and reap considerable profit each year.

Livelihood support through Backyard Poultry

As in the case of most traditional systems of rural production, backyard poultry is also considered backward and ignored by researchers, policy makers and planners alike. However, given that it is a common practice among the households in the Chintamani project area, with the women having significant experience in managing it, FES decided to support this activity.

Though initially, we purchased poultry from the Central Poultry Development Organisation (CPDO) to provide it to the beneficiaries, subsequently we stopped the practice and instead encouraged the farmers to choose good quality native poultry from either their own village or from adjoining villages. Under the various watershed development programmes, FES along with the watershed development committees identified the beneficiaries to encourage backyard poultry in the area.

Lalithamma, a daily wage labourer who had five members in her family, was chosen as a beneficiary and given a grant of Rs. 1000 in 2011 to purchase poultry with which she purchased two hens and a cock. The hens have already had three clutches of chicks. The chicks were raised and she sold five for Rs.1500 while the second time she sold a brood for Rs.1200. While the household has consumed some eggs, it has earned an income of Rs. 3500 against an initial investment of Rs. 1000. Lalithamma intends to continue this activity as it provides valuable supplementary income.

Livelihood Support through Sheep Rearing

A case from Mudimadagu

During one of the monthly meetings of the watershed development committee in Tatimanipalli village in Mudimadagu Grama Panchayat, the members listed out the possible options of helping the landless in the village. The most suited option, which was also in keeping with local knowledge and grazing conditions, was found to be sheep rearing. Ramana Reddy's family was one such landless household which was identified for assistance.

Disowned by his family, Ramana Reddy and his wife were landless daily wage workers and earned approximately Rs. 1350-1500/- per month. The watershed committee gave him a grant of Rs. 5000, to which he added Rs. 500 of his own and bought two pregnant sheep from the local market. He got the sheep insured and also ensured that necessary vaccinations are provided from time to time. He looked after the two male lambs that were born soon after for a year and then sold them for Rs. 8000. Realising that sheep rearing is a good source of income, Ramana Reddy added to this amount another Rs. 8000 that he took as loan and bought ten male lambs. He reared the sheep well and a couple of months later, he sold the entire herd for an amount of Rs. 25000.

With this money, he not only paid back his initial loan of Rs. 8000, but also took 20 kunta (0.2 hectare) of land on lease and started farming again. During the *kharif* season, he cultivated tomato and made a profit of Rs. 47000/- while during *rabi*, he cultivated paddy for household consumption. He ensured that the profits he earned were deposited in a bank account to earn him some interest. Meanwhile, he bought more sheep after a few months, he sold another one for Rs. 6000. With the cumulative amount, he purchased his ancestral land from his father at Rs. 60000 and is now the proud owner of 2 acres (0.8 hectares) of agricultural land and 3 female sheep.

Livelihood Support for Rearing Native Cattle Breeds



In Kottamvaripalle, the village institution identified 5 individuals, namely, Mr. Rama, Mr. Anjannappa, Mr. Narayana, Mr. Narasihumulu, and Mr. Rammurthy, as the poorest of the poor in the village after a series of village level meetings and each one of them was given a native cow.

The rate of the each cow was decided at Rs.15000 on the basis of discussions with the institution and the prevailing current market rate of the native cattle breed. The identification and selection of cows and purchase of the same was the responsibility of the individual beneficiary and the village institution, which was given Rs. 75000 for this purpose. The beneficiary contribution was in the form of insurance of the cows. The cows were purchased subsequently at the Gorantla cattle fare.

At present, all the cows have given birth to calves, each valued at Rs. 4500-5000. The milk is used for household consumption, while a small portion is sold to other households in the village. Since these cows belong to the native breed, they require minimal maintenance and are left open to graze on common lands. The beneficiaries are, therefore, optimistic about increasing the number of cows owned and generating additional income

Supporting the Poorest

Bhaskar Reddy in Mudimadagu

Bhaskar Reddy belongs to Yerlampalli village in Mudimadagu Grama Panchayat and while he belongs to one of the dominant castes in the village, he is landless and has no regular source of income. Till some time back, he survived on wages earned through agricultural labour and odd jobs like whitewashing houses. At times, he would also buy a handful of vegetables from the farmers on whose lands he used to work on and sell them in the nearby villagers for a meagre profit of one or two rupees per kg of vegetables. Through these different livelihood strategies also, he was barely able to meet his subsistence requirements.

The Watershed Development Committee chose him as one of the beneficiaries for improving his income. The committee gave him a grant of Rs. 2500 to which he added another 10% or Rs. 250 and purchased a vegetable cart from the local market to use it for vending vegetables bought from households in the village. Small landholding households in the area produced small quantities of different vegetables. While most was consumed by the households, the rest was given away to other households free of cost. Bhaskar Reddy as well as these households saw in this enterprise an opportunity to learn a little extra money.

With a cart of his own, he is now able to collect larger quantities of vegetables from the households each morning and sell it in nearby villages during the day. On days when other households call him for odd jobs, he winds up his collection early and sells his stock late in the evening. If the availability of vegetables is limited, Bhaskar also procures fruits like mango and sweet lime for sale. This activity alone gives him a daily income of Rs. 80-100 or around Rs. 3000 per month, and he no longer has to depend on greedy moneylenders to sustain his basic requirements.

D. Narayanamm in Dhaniyanicheruvu

D. Narayanamma belongs to landless household in Dhaniyanicheruvu village and is the sole bread earner of the house owing to her husband's disability. Earlier, she ran the household by working for daily wages in agricultural fields of other households. However, since the wages were not enough, she invested her small savings to take up the sale of fruits in the village centre.

Under the NABARD-WDF watershed development programme, she was identified as 'the poorest of the poor' and selected as a beneficiary for livelihood interventions by the Village Watershed Committee. In March 2011, she was given a loan of Rs. 2000 at a nominal interest rate of Rs. 0.50 per month and to be paid in ten equal installments.



Narayanamma used Rs. 1500 the money to purchase fruits from nearby markets in bulk.



Walking to nearby villages in order to sell these fruits, she was able to sell the entire stock within 3 days and earned a profit of Rs. 600. This would translate into a daily wage of Rs. 200, a considerable improvement from the wages she received earlier. With the increased savings, she has started a petty shop for her husband where he sells

bhajjis, chocolates and other items and earns Rs. 50-60 per day. She has also started the repayment of the loan.

Bamboo Stick Making

A livelihood opportunity for the Poor of Satkosia fringe villages

Puruna Kantabeda of Tainsi Gram Panchayat, Angul block is a village on the fringes of the Satkosia Wildlife Sanctuary. The *hadi* or the dalit community in the village is mainly dependent on Non Timber Forest Produce (NTFP) and wage labour for its subsistence. One of the main NTFPs that they use to meet their cash requirements is bamboo (Salia, Karada, Sindurkani), abundantly available in the forest areas, especially through basket weaving. Therefore, FES took initiative in promoting livelihood strategies based on bamboo under the JTT-NABARD watershed programme.

The watershed development committee initiated the work of making sticks for rolling *agarbattis* or incense sticks in the area. This proved to be a low-cost activity as it was made from the left over bamboo sticks used for basket-weaving, the demand of which has declined in recent times. And also, since they were made from dry bamboo, they were not vulnerable to moisture and fungal attacks. This was considered to be a viable option since the District Supply and Marketing Society (DSMS), Government of Odisha has tied up with ITC Ltd. for the supply of sticks for rolling *agarbattis* with specific dimensions. While initially, it paid Rs 20 per kg, later the price was increased to Rs. 26 per kg due to the high quality of the sticks produced. A person investing a full day in making incense sticks can produce more than 3 kg of sticks. A minimum of Rs. 600 per household was invested by the watershed development committee for the purchase of the hand-pushed machine, saw and scale, for the ten selected beneficiaries. While the committee coordinates the entire



process, FES provides technical and managerial assistance. Till around May 2011, these households have together supplied 177 kg of sticks for rolling agarbatti and earned an income of Rs. 4486.

The success of this initiative motivated people in three more villages, namely, Kumuri, Bhaghamunda and Olaberi to take up this activity. FES and DSMS of Angul and Mayurbhanj districts organised an exposure visit of select persons from these villages to Betnoti village in Mayurbhanj. In this visit, they met some officials of the DSMS, including the cluster in-charge, Mr. NC Sharma, who is also involved in this business, collecting incense sticks from the households and making payments to them. The participants also visited two villages, Dahikuthi in the Bramarguda Gram Panchayat and Sethlo in the Gurudubasa Gram Panchayat, where it was found that all the members of the households were involved in the activity of incense-cutting. The incense stick workers of Mayurbhanj clearly stated that the activity is not a source of profits but helps them meet their subsistence requirements. Yet, they have adopted it since their traditional occupation of basket-weaving is no longer economically viable. In a feed-back session held after the visit, the participants indicated their optimism about receiving adequate returns from the activity. Recently, 10 pedal operated machines have been purchased by FES in order to upscale the production of cutting incense sticks.



Livelihood support and ecological restoration through MGNREGA

Byrganhalli village in Thimmasandra Panchayat in Siddlaghatta taluka, Chikkaballapur district is a village of 80 households which are primarily dependent on agriculture and animal husbandry for their subsistence and more than half of which are SC/ST. Located in a rainfed area, only 8 households in the village have access to any kind of irrigation facility. Sheep and other livestock are reared on common land which is highly degraded due to encroachments, illegal felling of trees and overgrazing. Further, the silting of the village tank has created shortage of drinking water for domestic and livestock consumption. As a result of such issues, there has been a proliferation of borewells in the village. The declining productivity of rural production systems has also led people to migrate for daily wages as low as Rs. 40-50.

With the introduction of the MGNREGA in the district, FES organized small awareness programmes in the village and ensured that 80 families got job cards and were allocated such work by the Grama Panchayat which also contributed to building durable assets in the area. The first activity involved building up a feeder channel which channelized water from the common land to the tank located downstream. The activity generated 360 person days of employment and approximately Rs. 29500 as wages. Subsequently, the desilting of the cattle pond, the construction of a nalla band in the *gomala* or pasture land, and desilting and bund-strengthening of the village tank were undertaken under MGNREGA.

Over the course of these activities, the wages under MGNREGA have increased to Rs. 125, contributing to reducing migration in the area to some extent. Moreover, since the activities have been related to soil and moisture conservation, they have helped in recharge of groundwater and in the availability of a more assured supply of water for livestock. Taking this forward, planting of local species on the *gomala* was planned for 2011-12 and around 1400 saplings of forest-tree species have been planted so far.

Works undertaken in Pokmakalpalli Village

Pokmakalpalli is a village in the Morgankunte Gram Panchayat in Bagepalli taluka, one of the most backward in the district with very high levels of poverty. There are around fifty households in the village with a majority being SC. While people work on their own lands during the monsoon, they work as wage labour on farms in other villages which have access to irrigation. At the same time, while MGNREGA had been implemented in the village, the wages were extremely low, like most other villages in this taluka.

In 2009-10, FES conducted awareness programmes on MGNREGA in the village, as a result of which three activities were taken up at the village level – construction of a cattle pond, cattle path and diversion channel. The cattle pond was constructed on the common land used by 800-900 cattle from almost 7 villages to graze and which had no other source of drinking water. This year, with the support of the FES team in Chintamani, the people are planning to plant different varieties of trees on the common land.

Making MGNREGS Accessible

FES has been partnering with several village institutions for the past couple of years for regularizing and strengthening the institutional processes of MGNREGS in Andhra Pradesh. During one of the meetings held on the 'MGNREGS Day' review meetings in Burujupalle habitation of Zunzurpenta Panchayat in Chittoor district, it was observed that most of the interested wage seekers were not coming forward for the activities under MGNREGS. The cause was found to lie in the incorrect details on the sanctioned list of activities by the designated Field Assistant. Discussions with him revealed that the sanctioned list from the Mandal office is given in English which he could not understand.

The matter was discussed with the Assistant Programme Officer, NREGS-AP, Thamballapalle mandal. The English version of the sanctioned activities and the rate chart for the activities in Zunzurpenta Panchayat was obtained and FES assisted the Field Assistant in translating it into Telugu. It was then written on chart paper and displayed on the walls of the Panchayat building. A small effort, it has helped in increasing the activities implemented under the scheme, in increasing transparency and accountability, and in assisting the wage seekers in making informed decisions.

MGNREGS Supporting Vulnerable Households

K. Venkataramana, a marginal farmer from Kotala village in Kotala Panchayat has been working under MGNREGA for the last two years. Two years back, owing to monsoon failure, he was unable to repay a loan which he had taken from a local moneylender to purchase groundnut seed expecting a good yield. Thus when the MGNREGA was launched in the village, Venkataramana and his wife enrolled themselves. Within a week of applying, they got work as wage labourers under the scheme. Venkataramana and his wife have earned a total of Rs. 20000 to 30000. Simultaneously, they have also sown mango on their land and this has proved to be a permanent asset for his family.

Diversifying Livelihood Strategies

The Case of Apiculture in Nuapada

Since the watershed area in Angul has a considerable expanse of forest land and adjoins the Satkosia Wildlife Sanctuary, there is considerable scope to pursue apiculture as a livelihood strategy. The cultivation of vegetables by the households in the area also supports this activity and the area has traditional honey collectors with expertise on rearing honey bees. Further, while the input costs are low (procuring the bee box and bee colony), the returns are considerable; the average annual production of honey in a year per box is around 8-10 litres and the rate of the same is nearly Rs.150 per litre, the local market providing ready market for the honey produced.

Following a meeting with the SHGs of Kantabeda watershed regarding their purpose and functioning, Maa Shiba Shakti SHG of Nuapada (11 members) came up with the proposal of undertaking apiculture. The SHG were provided with 11 honey bee boxes on a cost sharing basis. It contributed Rs. 500 per box, out of which Rs.100 was paid towards collection of bee colonies by traditional honeybee collectors. While the production was mainly for consumption, the FES team assured them that in case of a surplus, they would assist in tying up with marketing agencies like Orissa Rural Development and Marketing Society (ORMAS).

The effort yielded 3 kg of honey, all of which was consumed by the households themselves. Also, as it was their first attempt, some bee colonies were not managed very well, resulting in production that was less than the overall potential.

Banana cultivation in Nuapada

A survey of Self Help Groups (SHGs) in Nuapada indicated that some members of the Laxmi Narayan SHG, formed in 2005, wished to undertake some group activity but were at a loss regarding the same. After continuous interaction with the group, including a training programme on the functioning of SHGs, the SHG members, most of them farmers, approached FES with the proposal for banana cultivation since they have some experience in cultivating banana under a programme of the horticulture department.

The SHG members distributed the work among themselves, while FES supported them with 100 saplings of tissue culture banana saplings after assessing the feasibility of the intervention and the potential of the group. Banana ripens fast, is high-yielding and has a substantial demand for banana in the local market. The entire cultivation took place on the land of one member while the water for irrigation was sourced from a nearby pond. FES also assisted the SHG on the technicalities of banana cultivation, i.e. size of the pits to be made, distance to be maintained between two saplings etc. The members have now also started inter-cropping on the land



with crops like ginger and chilly. The initiative has not only helped in giving the members an additional source of income but also provides a platform which brings them together.



Energy Conservation

Promoting Energy Efficiency: Bhattis and Biogas Plants

The Rationale

For most households in the rural areas as also for some in rural-urban centres, firewood, derived chiefly from the Commons, i.e. common land and forests, is the main source of cooking fuel. Extraction of fuel wood on such a large scale places considerable burden on the fast-depleting Commons. At the same time, often fuel wood is purchased by these households from the market, adding to their expenses and more often than not, their poverty. Further, traditional *chulhas*, which are energy inefficient, employing fuel wood also release large quantities of smoke and result in health problems.

It is in this context that more efficient means of energy utilization as well as alternative sources of energy have been proposed, devised and introduced by FES in different project areas. A number of energy efficient bhattis and biogas plants were constructed in the last few years, with both economic benefits for the households as well as reduction in the anthropogenic pressure on the environment. Such efforts are also important in order to complement the biophysical interventions and institutional arrangements which help in increasing biomass and in regulating the extraction of fuel wood from common lands and forests but nevertheless, get restricted to the supply side dynamics of biomass. Energy conservation measures address the demand side of biomass production, i.e. the consumption patterns involving heavy extraction of biomass, including fuel wood, and thereby ensure that improvements are sustained over time.

Energy Efficient Bhattis

With the aim of facilitating efficient utilization of fuel wood, thereby reducing the pressure on the Commons as well as the expenditure of people on fuel wood, FES entered into collaboration with Technology Informatics Design Endeavour (TIDE), a private firm with a focus on energy devices. Under this, energy-efficient bhattis or

metal stove units were introduced in 2007-08 in some locations in Madanapalle, namely Molakalacheruvu, Kalicherala, Thambalapalle.

In order to select the beneficiaries of the programme, a survey was conducted by FES on the amount of fuel wood that was being supplied to rural-urban centres and to assess which users were using fuel wood at a high rate. The survey indicated that roadside eateries and restaurants, stoves for making dosas and frying stoves in the area consumed the greatest amount of fuel wood in the area. Factors such as income levels, living space, and willingness to replace existing traditional *chulhas* played a role in determining the beneficiaries.

Three models of bhattis were proposed by TIDE- Type 'A' (two and one large cooking pots), Type 'B' (tava type) and Type 'C' (khova/kadhai type). The stove units were installed with the help of the resource person in



the area in which the beneficiary resided. The resource person imparted training to the beneficiaries on the usage and regular maintenance of the installed devices so that they can work with optimum efficiency. The total cost of constructing the bhatti was Rs. 12000, Rs. 8000 and Rs. 60000, respectively. There were a total of 36 beneficiaries across all three project locations.

Mrs. M. Sakeenabee, owner of a restaurant in Thambalapalle which supplies around 150 tiffins and meals daily, working on the Type B bhatti.

In the case of each type of bhatti, the cooking time was found to have reduced from 4 -5 hours to 2 hours, i.e. by more than 50%. The thermal efficiency of these energy efficient stoves ranges from 30-40%, and they contribute to a concomitant fuel saving of around 30%. The average monthly reduction in fuel wood and expenditure incurred came to around 35%, 30% and 20% for Type A, Type B and Type C respectively. Beneficiaries also indicated that the bhattsis reduced the smoke emission considerably as a result of which their utensils were not blackening as much and therefore the time spent in cleaning the utensils and the resultant drudgery reduced. FES intends to upscale the initiative in order to ensure that the economic, ecological and health benefits of such an initiative can be realized on a larger scale. It has been planned that 45 bhattsis (15 tava and 30 kodhva) will be installed in these areas by the end of May 2012.

Biogas Plants

Madanapalle

In 2007-08, FES undertook a collaborative project with Non-conventional Energy Development Corporation of Andhra Pradesh Limited (NEDCAP) to construct biogas plants in Thambalapalle and Kalicherala cluster. As a part of this effort, around 400 biogas plants were constructed in 63 villages – 333 in 51 villages in Thambalapalle cluster and 65 in 12 villages in Kalicherala cluster with around 15000 beneficiaries. Each biogas plant has a capacity of 2 cubic metres and costed approx. Rs 10000. While FES contributed Rs 200 in this amount, the beneficiary was required to dig the pit (involving labour cost) and provide small sand and gravel. NEDCAP contributed towards the cost of 25m of the gas pipe while the beneficiary was required to make payments for extra length metres, if required. Roughly, the cost of the biogas plant for each beneficiary amounted to Rs. 8000-8500.

A preliminary survey of the working status of the plants constructed indicated that less than 40% of the plants are in working condition. A concerted effort is being made by the team in Madanapalle to resurvey these plants in order to identify the exact issues, involve a technical expert from NEDCAP and are also considering the

option of a parallel monitoring and repair mechanism in the form of trained Para-Workers.

Bhilwara

In Kalyanpura watershed, some biogas plants have been constructed in the past and the experience helped create better preparedness for the expansion. Yet, perceptions of the people regarding biogas, viability of the technology in rural areas, and the economics of the biogas system were carefully assessed before expansion.

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In the first phase, four biogas plants were installed in Jhanjhola village last year with the aim of gradually scaling up. To minimize the reliance on 'outside' assistance and develop experts on biogas within the community, the skills of a group of community members (including women) were enhanced. The plants worked well throughout the year and helped each household save about twenty quintals of fuel wood over a year. The plants are also useful in providing residue organic waste, after anaerobic digestions which has superior nutrient qualities over the usual organic fertilizer (Farm Yard Manure).

The success of this initiative led twenty households in Jhanjhola itself to demand biogas plants. Capacity building of individuals within the community with respect to the functioning of the biogas plants has increased the viability of the technology in the long run.

Rural Volunteers



Rural Volunteers – Improving Planning

Subsequent to his selection as a Rural Volunteer, LV Srinivas from Lakkepalli of Ganjikunte Panchayat, received training on various aspects of local governance and started discussing MGNREGA with the community in formal and informal gatherings, insisting on people's participation in the planning process. Further, while earlier the scope of planning was limited to undertaking drainage works or developing individual assets, he encouraged the community to think along the lines of augmentation and management of common pool resources.

During the planning process in 2009-10, Srinivas brought up the issue of the village tank which earlier irrigated a few acres of land but has had now silted up. It was unanimously decided that the tank should be de-silted under MGNREGA. He also motivated the community to undertake plantation on the *gomala* (common land) under MGNREGA. Moreover, he mobilized the community to contribute *shramdaan* to construct a cattle pond and a task for which the budget was Rs. 2 lakhs was completed for a cost of Rs 65,000.

Srinivas is convinced that the change that has come about towards participatory planning processes and community-led resource management and maintenance can be attributed to his consistent engagement and dialogue with the community and the training he has received as a Rural Volunteers.

Role of Rural Volunteer: Natural Resource Governance

V C Narasimhappa, belonging to Muduvaaripalli in Erramvaaripalli Panchayat, is a Panchayat member and a Rural Volunteer at present. The village has 5 acres of gundu topu (pasture land) which has been used as a common pool resource to meet fodder requirements and was governed by the rules established by the village ancestors. However, since neither the Panchayat nor individuals had sufficient funds, the land remained neglected and undeveloped.

However, after being trained as a Rural Volunteer, Narasimhappa decided to leverage funds from MGNREGA for developing the pasture land. During the planning process, he persuaded the panchayat to include the development of this common land in the plans. However, as the community could not visualize the benefits derived from this, they did not readily accept the proposal. Nevertheless, he did not give up and conducted several meetings and tried to convince community about the benefits to be derived from developing the pasture land. Subsequently, he visited different departments (social forestry, watershed etc) and Grama Panchayat members to gather information on plantation, rates for pitting etc. With this information, he once again mooted the proposal in the Grama Sabha and managed to get the approval for the plan.

Narasimhappa, along with few interested persons, made plans for pitting and planting 200 saplings of two varieties (black plum and mahua) under NREGA. In addition, he got approval for watering the saplings for about two years under the scheme. Also, he planned and undertook agave saplings as a fence/boundary to prevent entry of livestock and encroachment by the neighbouring farmers. He plans to develop the land in future with the revenue generated from the agave, tamarind and other trees. During a village meeting, he, along with a few others, also proposed to frame rules for grazing and fodder extraction from this plot as a protection measure and considering the benefits to be gained from such arrangements, the community agreed.

Abhimanyu Nayak -A Rural Volunteer in Nuapada

Abhimanyu Nayak, an educated farmer belonging to Nuapada in Tainsi Gram Panchayat, has been involved with the work of FES since 2008. Selected by his village institution to be trained as a Rural Volunteer, Abhimanyu attended a number of trainings, exposure visits and orientation sessions both within and outside Odisha. He went on an exposure visit to Biswanakahani in Cuttack, Srikakulam in Andhra Pradesh, Bhilwara in Rajasthan and Anand in Gujarat to understand implementation of MGNREGA and watershed programmes, soil moisture conservation, ecological restoration, and community-led natural resource management and its links with livelihoods. He was also trained on various technical and institutional aspects of natural resource management on various occasions.

These capacity building programmes have enabled Abhimanyu to undertake various eco-restoration and livelihood activities in his own and neighbouring villages under the watershed programme. He supports the villagers in activities like small gully plugging, boulder work, building water trenches, percolation tanks and farm bunding. In addition to this, he has also been involved with a nursery of forest-based plant species which has augmented his income. Species like mango, papaya, guava, cashew and lemon are purchased by local households and cultivated by him in the nursery.

As a Rural Volunteer, Abhimanyu has stressed on community-led processes and contributed immensely to the timely implementation of the watershed project. Abhimanyu's engagement with the Household Census Survey and Net Planning has further added to his understanding of the surrounding natural resources and the plans for their development. His involvement in community mobilization and in developing the multi-actor platform has equipped him to resolve village/inter-village conflicts. Regular involvement in the meetings and functions of the Charmalik Regional Federation exposed him to regional perspectives of promoting natural resource governance. At the same time, he has used opportunities like the Krushak Mela to advocate the relevance of the federation at the local, block and district lev-

els. The transformation of Abhimanyu to a leader of sorts, advocating the interests of his community and those belonging to the fringe villages of Satkosia Wildlife Sanctuary, has also transformed Nuapada from a hitherto marginalized village in the Panchayat to one of the most active in the watershed area.

Prabhakar Sahoo- A Para-Worker in Angul

Prabhakar Sahoo, a young farmer and tube well mechanic belonging to Nuapada, has been associated with FES as a Para-Worker since 2008. Prabhakar has been a part of various trainings, meetings and exposure on the need and functions for Para-Workers, on soil moisture conservation measures and on various livelihood activities, such as agriculture, horticulture, pisciculture and animal husbandry.

As a Para-Worker, Prabhakar has been involved with different village, watershed and regional level activities. He has been an active participant of household surveys and net planning in the village, and has also facilitated implementation of the bio-physical and institutional dimensions. Prabhakar has also played an important role in mobilizing the village community and in the activities of the Charmalik Development Federation.

He has supported the livelihood interventions in this watershed by involving the self-help groups in the village in agricultural activities, such as cultivation of banana, papaya, ginger, turmeric, yam, bean, tomato, vegetables, and even apiculture. He has assisted in the formation of a farmers' interest group and helped them in accessing the compensation for loss of crops due to wild animals attack by facilitating dialogue with the Forest Department. In the coming years also, Prabhakar hopes to assist in and undertake various activities pertaining to the promotion of agri-based livelihoods, such as promoting technologies demonstrated by institutions like Krishi Vigyan Kendra and ICAR, water efficient crops and organic farming practices.