TOWARDS A DECENTRALISED GRAIN MANAGEMENT SYSTEM

MEDAK DISTRICT, ANDHRA PRADESH, INDIA

INTERIM REPORT

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SUMMARY

- **Project Background**

The project titled 'Decentralisation of Grain Storage', funded by the Department of International Development (DFID), Government of the United Kingdom (UK), has three partner organisations: the Indian Grain Storage Management and Research Institute (IGMRI), Hyderabad, India, the Centre for Environmental Concerns (CEC), Hyderabad, India, and the Natural Resources Institute (NRI), Chatham, UK. The project began in July 2000 and is scheduled to end in April 2003.

- **Project Objectives**

The project aims to develop strategies that improve food security of poor households through increased availability and improved quality of cereals and pulse foods and better access to markets. Specifically, it seeks to examine the institutional arrangements associated with community-managed storage and distribution systems, as well as to resolve the technical requirements dictated by these systems for the storage of dry-land crops, and to draw wider lessons concerning decentralised, village-based approaches to the provision of food security.

- **Project Activities**

The project is focused on providing technical support to an NGO-managed UNDP village-level food security project. The UNDP project seeks to enhance the food security of vulnerable women and their households through group-based activities that enable women to access productive resources through the cultivation of fallow lands. This group formation will then be used as an institutional basis for storage, distribution and sale of commodities, as well as other activities that can contribute to livelihoods of these households. A menu of appropriate storage arrangements are to be selected and tested, that provide effective protection against serious grain deterioration.

- **Project Outputs**

Three distinct project outputs are expected.

- A set of validated recommendations for the establishment and administration of village-level institutions for food security and food distribution in the project target area.

- Validated storage technologies for sorghum appropriate to the needs of a decentralised approach to village-level food security and food distribution.

- Policy guidelines concerning decentralised, community-based approaches to the provision of village-level food security prepared.

Current Status

In January 2002, the project is roughly at its halfway stage, having completed a year and a half of work and with another a year and a half to go. Fieldwork has been initiated in 3 villages in Andhra Pradesh: (1) Mirzapur (N) in Nyalkal mandal of Medak district (2) Kollur in Jharasangam mandal of Medak district, and (3) Thogapur in Kosgi mandal of Mahboobnagar district. Following discussions between CEC staff, IGMRI staff and villagers, a food storage bin has been constructed in Mirzapur, and two are under construction in Kollur and Thogapur.

This Report

This report presents the findings of a joint review undertaken of project activities by consultants of NRI (UK), CEC and IGMRI staff in January / February 2002, consisting of (1) a review of the literature produced by CEC to date and (2) a brief field visit to Mirzapur to assess the socio-economic details of the operation of the (only) constructed grain storage bin (to date).

MAJOR POINTS FROM THE LITERATURE REVIEW

- **Food Security**

Food security is defined as "access by all people at all times to enough food for an active, healthy life…[whose] essential elements are the availability of food and the ability to acquire it"(World Bank, 1986). A wider definition of food security incorporates quality of life indicators and holds that food security implies livelihood security at the level of each household and all members within, and involves ensuring both physical and economic access to balanced diet, safe drinking water, environmental sanitation, primary education and basic health care. (UN, 1987)

Although food security is defined at various levels, global, national, regional, state, household and individual, food security at the national or regional level does not necessarily indicate food security among regions, communities, households and individuals. Household food security is the capacity of a household to access a stable and sustainable basket of food when it needs it. This requires putting in place necessary policies and actions to make adequate food available as well as accessible at the household level across seasons and transitory shortages (IFAD, 1996, pp. 3-4).

- **Poverty and Food Security**

Poverty is a major determinant of food insecurity, since physical availability alone does not ensure economic access to food. The poor do not always have adequate income to secure their access to food, even when food is available in local markets.

- **Food Security Issues in India**

Unlike the 1960s 1970s and 1980s, the 1990s saw a slow down in the growth of area under food grain as well as productivity per acre, causing per capita production level to stagnate. While per capita supply of food grains is often taken to be an indicator of household food security, such aggregation can mask inequitable access to food for the poor. The Public Distribution System (PDS) is an important part of Indian government efforts to address the food insecurity of its poor. However, its benefits go primarily to the urban areas and, by and large, it is extremely ineffective in tackling the food insecurity of the rural poor. Paradoxically, there is mounting hunger and recurring starvation deaths even when food grain stocks held by the government are increasing: despite the PDS about 80% of the rural poor are forced to buy food at high prices from the open market. While India may have achieved food security at the national level, it has not yet achieved it at the household level.

- **Household Food Insecurity in India**

'Lean' seasons, which do not offer income generation or employment opportunities, tend to affect the rural poor more than the rest of the year, especially in drought-prone semi-arid tracts. Though the stressful, lean season may span from a few days in a month to a few months, food scarcity increases prices, which put food out of the reach of the unemployed poor. The poor cope with such seasonal fluctuations in different ways: by giving priority to food crops like sorghum, by building up stores of assets, grain and livestock during good seasons, by falling back on familial and cultural relationships (or 'social security nets'), by migration to urban areas, pawning or selling of assets, and, in dire circumstances, sale of farm land, wives or children. A succession of lean seasons can lead to extreme

adverse effects like starvation deaths. Food insecurity, thus, continues in spite of government initiatives like the PDS and Employment Guarantee Schemes.

- **Impacts of PDS on Cropping Patterns**

The remunerative procurement prices offered by the government for wheat and rice has seen a shift in favour of fine cereal crops like rice and wheat and a consequent neglect of rain-fed dry land agriculture, which produces food crops like sorghum, pearl millet, and finger millet. Rain-fed agriculture in such resource-deficient semi-arid areas has historically been characterised by poor quality of land, variability of weather, high economic risks and uncertainty, scarcity of water for even life-saving irrigation, proneness to drought and other weather-related damage, low capacity for investment, low land and labour productivity, all of which result in low and uncertain production and consequently, small and varying profit margins. The further deterioration in the economic viability of rain-fed agriculture has drastically affected the livelihoods and hence food security of the people in these areas. Despite this, rain-fed agriculture is crucial to Indian food security as it currently sustains 40 percent of the human population and 60 percent of the cattle, and it also contributes 44 percent of total food production in the country. On the other hand, the area under irrigated agriculture is growing by less than one percent, limited by environmental constraints like spreading salinity and alkalinity of irrigated lands, and the vast financial resources needed to take up irrigation projects.

- **Storage Losses**

Even if sufficient food is produced, however, storage losses eat into food availability and can undercut efforts to bring about food security. In India, food grain wastage costs are estimated to be Rs. 230 billion (US$ 5.75 billion) per year. Inadequate storage facilities at the farm level are particularly problematic in India because (1) Farmers tend to retain a substantial proportion of their food crop output for self consumption, seed, feed or to pay wages in kind; and (2) farmers with inadequate storage facilities are usually compelled to sell their grain soon after harvest. Storage losses can be quantitative loss (a reduction in weight or volume) or qualitative, nutritional, hygienic or economic (since less money will be received for grain of poor quality).

- **Traditional and Improved Grain Storage**

Indian farmers use several types of grain storage structures, including, straw storage structures, bamboo/reed structures, earthen structures, masonry structures, underground structures and bag storage, each with its own capacity, life spans, advantages and disadvantages. Most traditional storage structures are cheap and economical unlike masonry storage structures, but most traditional structures are not insect proof, moisture proof, rodent-proof, and some are not fire proof. The Indian Grain Storage Management and Research Institute (IGSMRI) has done extensive work on grain storage problems in India and has come up with suggestions to improve the traditional methods, including storage bins, hermetic sealing and integrated pest management.

- **New Initiatives**

Grain Banks

The Jan Seva grain banks programme in Pune, Maharashtra, and the Andhra Pradesh Participatory Tribal Development Project seek to help tribal (adivasi) farmers by collecting contributions during harvests and lending them food at affordable interest rates during the lean season. Grain banks, thus, supply the nutritional needs of disadvantaged sections during a period when they do not have the resources to buy food, help them avoid the debt traps of profiteering moneylenders, increase the bargaining power of tribal farmers, provide additional work opportunities (thus reducing distress labour migration) and offer surpluses for community development work as well as for individual requirements.

The Rice Credit Line

A recent initiative of the Centre for Environmental Concerns (CEC) is to arrange for women's self-help groups (SHGs) in Medak district, Andhra Pradesh, to access rice meant for the government's drought-relief food distribution scheme. Under this initiative, which started in 2001, the women's self hel group (*mahila sangham)* pays the Mandal Civil Supplies depot up front, collects the rice, and transports it to the village, where it is immediately given on loan to villagers. A small cost differential covers the costs of interest, transportation, and management and to generate some modest savings for the women's group. Households repay the women' group, which then approaches the Civil Supplies Depot for more supplies. Currently, The Society for Elimination of Rural Poverty (SERP), an autonomous body promoted by the AP Government has appointed the nodal department and CEC is involved in the further expansion of the scheme.

Fallow Lands and Leased Lands Programmes

CEC pioneered a scheme to provide credit to women farmers to cultivate their own fallow lands as well as to lease private lands belonging to larger farmers (who found it unprofitable to cultivate them), and to begin cultivating sorghum and other crops that form the basket of essential food crops. Alongside, they also took up a grain bank programme to insulate themselves from market fluctuations. This programme has not only helped women gain control in dry land agricultural management and enhance wage and income opportunities for women, but also, working as a group has strengthened co-operation, encouraged them to meet, discuss and take decisions regarding the land and enhanced their confidence in their ability to manage their own affairs. Further, internal family relations improved with the absence of the tension of finding food for the next meal, and women's role in decision-making within the family was enhanced. With time saved from having to find food for the family, women now had enough time to attend group meetings and group activities. And the ready availability of rice at affordable prices meant that households did not have to approach the local moneylenders for credit at usurious rates.

- **Problems with storage**

Under the food security scheme pioneered by CEC, women farmers who participated in the programme contribute sorghum to be stored. This is then distributed among the needy during lean season. While the collected grain was stored in the house of one of the members, in adequacies in storage led to a good proportion of food grain is lost due to dampness as well as due to rodent menace. As the methods that they are aware of in tackling these problems are not successful they searched for alternatives. A problem with decentralised grain storage for sangham women in Medak district was the entry point of the present project, which aimed to provide technical assistance to the women to reduce losses in grain storage.

MAJOR FINDINGS FROM THE REVIEW OF FIELD WORK

- **The Community Storage Bin in Mirzapur**

CEC has been involved in Mirzapur (N) since 1994 on a number of initiatives and the community storage bin is only one of the latest in a chain of interventions, starting with the setting up of the *mahila sangham*. The masonry grain storage bin constructed in Mirzapur in 2000 cost nearly Rs. 36,000, which at today's prices comes to about Rs. 42,500. It costs nearly Rs. 11,000 per year to operate, which includes the transport and boarding costs of CEC and IGMRI persons who supervise the quality and operation of the bin.

Although in terms of a pure business model, managers of a grain storage bin would try to maximise the profit of buying grain cheap and selling dear (after paying for the operational costs of running the bin), in both years of operation of the bin, viz., 2000 and 2001, grain was bought and sold at the same

price. Grain was purchased from the fallow land programme of Mirzapur (N), and the leased land programmes in the three villages of Mirzapur (B), Mirzapur (N) and Malkapur.

The grain in the bin was sold to sangham members at Rs. 550 per quintal in the first year, and Rs. 400 in the second. Sales were during August and September, which is in the lean season. Sangham women bought 36.90 quintals from the bin in 2000, and 33.25 quintals in 2001. In both years, however, there was a surplus of grain in the bin. Thus, profits from the operation of the grain bin are zero in the first year, and negative in the second, without taking into account the interest on capital or the costs of operation and maintenance.

Even if the bin was not run on a 'business model', and was meant to sell grain on credit to poorer villagers during the lean season, when open market grain prices are high, sangham members managing the bin are not keen on giving grain on credit because repayment is not assured. This is an important finding in the light of one of the stated purposes of the community grain bin – to loan grain to members in times of distress, when prices are high, which can be repaid later in cash or in grain.

- **Operation of the sangham**

The community grain storage bin is officially managed and operated by a 5-member Food Security Committee, led by Bayamma, a founder member of the women's sangham in Mirzapur. The major decisions taken include choosing the location of the bin, its size (1.3 tons), and structure (reinforced cement concrete (RCC) bin, rather than metal bin).

From discussions with sangham women it is evident that not all members were clear about the basis of certain decisions taken within the sangham (e.g., for distributing buffalo loans and solar lamps and choosing the few who would work on leased land). The displeasure of the 'left out' sangham members is surely detrimental to the future sustainability of the sangham and needs to be tackled.

- **Problems with the Bin**

While the women are generally happy with the location and size of the bin, they are unhappy about certain other features of the bin: (1) the lack of a partition to hold kharif and rabi grain separately; (2) the heaviness of the RCC lid, which makes it difficult to open and has also injured some women's fingers; (3) pest infestation due to moisture seeping in from the outlet, which was not fitted properly. In hindsight, the sangham women feel a stone structure with a light and smooth finish in cement is better than the RCC bin (but metal would not, since it would rust). IGMRI did not anticipate these problems at the outset, and have ruled out partitioning the bin at this stage. However the installation of a fibreglass lid and tackling the problem of moisture were possible, and estimate the costs of repair at Rs. 3,100.

- **Benefits of the Bin**

Sorghum purchasers gain at least the cost of transportation and wages forgone, even if market prices were charged for the grain. While this was so in the first year, in the second year (2001–2), market prices have fallen below the purchase price of the sorghum, due to which there are few takers now for the grain in the bin.

Consequently, it is difficult to conclude definitively that the bin has provided the anticipated benefit of selling (or lending) grain at lower-than-market rates to poorer households in the village during the lean season. While the sales have indeed been during the lean season (August – October) when household grain stocks are running low and before the kharif crop has come in, the price differential is difficult to establish without more accurate data.
Those who sold sorghum to the bin in both years have clearly benefited, since selling to the Sangham would save the sellers the transportation costs, the commission the *hamali* (cartage) charges, etc., all of which amount to about Rs. 25 per quintal. Sellers include the sangham members in Mirzapur (N) who

produced sorghum on their fallow lands, and the sangham members in Mirzapur (N), Mirzapur (B) and Malkapur who produced sorghum on land leased from other landowners in the village.

- **Falling Market Prices**

Available data show a decline in the price of kharif yellow sorghum and hybrid sorghum over the period October 1998 to January 2002, while the price of rabi white sorghum has a sharp dip in the middle of a generally declining trend. Falling prices mean that the real value (or purchasing power) of the money wages earned by villagers rises: they can either buy more grain by spending the same amount of money as before, or buy the same amount a before by spending less than previously. Both confer benefits that indirectly improve the food security status of these villagers.

- **Alternatives to the Community Storage Bin**

Two possible alternatives to a community storage bin are (1) individual storage bins and (2) a community storage structure where individual bags of grain can be stored. Individual storage bins made in metal or in plastic overcome the rodent problem that plagues traditional gunny bag storage. The Save Grain Campaign of IGMRI provides a 10-day training and a 1.25 quintal metal bin at a subsidised cost of Rs. 60. However these bins can only be used for seed grain storage, while plastic bins, being bigger, can be used for grain storage as well.

A community storage structure in their village, built like a room where individual bags are stored (say on shelves), labelled with the name of the owner, would allow villagers to bring their own bags to the structure and 'withdraw' grain from their own bags as needed. This would give an incentive to all sorghum producers in the village to store their grain in the community storage structure – rather than just the sangham members who produced sorghum either on leased land or on their own fallow lands, and would overcome the problem of mixing grain types and quality into a single bin. Assuming that villagers would be willing to pay the equivalent of the losses to rodents (around 5 kgs per quintal at average prices), and that half of the sorghum produced in the village were stored in the community storage structure, around Rs. 13,520 would be available per year to run the community storage structure. If the operating costs are Rs. 1,000 per month, and the bin only works for 6 months in a year, the bin could pay around Rs. 7,500 per year of operation towards even construction costs (which would pay off a Rs. 1,50,000 structure in 10 years).

- **Land Lease Programme**

The operation of the community storage bin in Mirzapur is strongly linked to the land lease programme. The sangham women were clear that while they would dry and store grain from their own lands in their own houses, the grain from the community enterprise on leased land would be stored in the bin. In other words, they stated that in the absence of a leased land programme, they had no use for a community bin. When asked if they would recommend a community bin for another village, they said they would only if there was some community production.

The leased land cultivation programme started in 1996-97, but it is the last three leases over the period 1999 – 2000 that are of direct concern since they provided some of the input into the community storage bin in Mirzapur. Of these the first has been completed and only the last two are in operation: 9 acres from Kashinath at Rs. 28,000, and 13 acres from Sooreddy at Rs. 110,000 (which, unlike the other lease, will be returned after the lease period).

Most of the kharif area is under green gram and sorghum (51 out of the 58 acres cultivated so far), though, pigeon pea was also grown on 17 acres, while most of the rabi area has been under chickpea (23 out of 61 acres), with 9 acres under rabi sorghum. Interestingly, sangham women have shown a preference for cash crops like chickpea, dhania and safflower, over a jowar crop.

- **Benefits from Leased Land Production**

Three types of benefits are generated from leased land cultivation: grain for free distribution among sangham members, wages for sangham members, and cash income from grain sale. It is important to note that only 20 out of 60 odd sangham members of the sangham have worked on the leased land. While these women earn wages in kind or cash, the rest of the sangham women benefit from free distribution and the sangham as a group benefits from earning cash income, which is used to repay CEC or to build up the corpus of funds for the future.

The members of the sangham cited the following benefits, divided here into community benefits (which benefit the village community as a whole), sangham benefits (which benefit the sangham as an whole entity), sangham members' benefits (which benefit all members), and sangham workers' benefits (which benefit only those working on leased land). Community benefits from the leased land programme comprise increased acreage and production in the village and distribution to the destitute, while sangham benefits comprise improved bargaining position in the village and earnings for the sangham corpus fund. Sangham members' benefits from the programme are greater availability of and access to grain in the village, a feeling of security with grain stored in the bin and free distribution of grain. Sangham workers' benefits comprise the development of a collective work culture, increased employment and pulses paid as wages.

- **Issues concerning Leased Land Production**

Two major issues concerning leased land production, given the close relationship that leased land production and the community storage bin, are the following:

(1) *Crop failures*: Since cultivation on semi-arid rain-fed leased land runs the risk of crop failure due to the scanty and variable rainfall, it could take a long period (perhaps 3-4 years) to break even on each lease; and

(2) *Cultivation for sale versus consumption*: Although sangham women cultivate most of the crops grown in the region, their cropping pattern indicates a preference for market sale: green gram is preferred over sorghum in kharif, despite the almost constant failure of green gram in the last three years (given cash returns from green gram are nearly twice as high); and chickpea is preferred over sorghum in rabi with its higher profit per acre. This suggests that the *sangham* women prefer achieving food security through earning enough money to buy food, rather than by growing food themselves.

- **Fallow Lands Programme**

A part of the input into the community bin is from the fallow land programme in Mirzapur. Under this programme, CEC paid for a tractor to till the hard ground of the land of sangham members that had been left fallow for many years for want of credit to cultivate. The critical input of credit, used in this instance to pay for tractor services, was necessary to begin cultivation on such land.

Sangham women perceive the following benefits from the fallow land programme: assured payment enables the use of tractors to plough fallows; bringing uncultivated land under cultivation; decrease in soil erosion; better food availability at the household level; and the newly-learnt skill of checking diesel levels at the time of ploughing. But perhaps the best indicator of the success of the programme is that there is a growing demand from non-members of the sangham to be included in the programme. The chief attraction appears to be the credit given for tractor ploughing, which in turn is necessitated by the non- availability of bullocks for ploughing.

- **Lessons For CEC**

Social Issues

The bin constructed in Mirzapur (N) village not only helped the women's sangham to address some of the problems they faced in storing grain, but the creation of such an asset also helped to enhance the status of sangham members in their village and gave an impetus to the activities of the sangham. However, even sangha members admitted that the bin and the grain stored in the bin belongs to CEC, and that CEC should have the responsibility to carry out any repairs or maintenance required.

Sustaining and building on the impact on the sangham nevertheless requires effective leadership, and too strong a leader (like in Mirzapur) or a weak leadership (as in Kollur) can affect sustainability adversely. Apart from managing the activities of the sangham and its members, the leader also has to tackle the impact of sangham members' families, especially men. The adverse experience in Kollur suggests that awareness about the benefits to each sangham member from collective activity needs to be created among the male members of the family too: women's empowerment cannot be left to women alone, and the sensitisation of men is equally necessary. And how this is managed depends at least partly on the nature of leadership of the sangham.

Field level problems

The project is not progressing according to the schedule, since by this time only one bin is in operation instead of all three (for various reasons). Also, till recently, sangham members had difficulties communicating with CEC staff and had to wait until the staff visited the village to voice their concerns. This has been solved to some extent because of the availability of telephones in the village.

Food Security For Mirzapur Households

Food security for poorer rural households can come either from having food or money to buy the food, during the times they need it. Villagers in Mirzapur have access to the main staples of rice and sorghum from several sources. Rice is available from own production, loans from landlords, wages from the government's Food For Work (FFW) programme, from the public distribution system (PDS), gifts from family members, and from the open market. Sorghum is available from own production, wages paid in grain from working on other farmers ' fields and from other family members, besides the open market. Sangham members also get free sorghum from the leased land programme as well as slightly cheaper grain from the community storage bin. Further, relative to other poor families, agricultural labour has the money from cash wages to buy food grain when required.

The data from 63 sangham members' households show that average monthly consumption of sorghum is slightly higher than that of rice (39 as opposed to 34 kgs). Aside from own production, (rice from) the PDS, and wages paid in grain, each household on average requires to buy around 96 kgs of sorghum a year (or 8 kgs per month) and 208 kgs of rice per year (or around 17kgs per month). Assuming a price of Rs. 7.50 per kg of sorghum and Rs.10 per kg of rice, the average monthly expenditure for a household comes to about Rs. 250. Expenditure on sorghum alone ranges from Rs. 30 to Rs. 60 per month. These figures ought to be underestimates since they exclude grain received as gifts from relatives, and free distribution from production on leased land. Still, Rs. 60 per month corresponds to less than 2 days wages for a single male or 1 days wage for a couple. However, the results from the small sample of 10 households surveyed during the review mission, contrast with this picture: in the sample, the majority of the grain consumed in the household comes from labour wages and own production and only a minority is purchased, these results suggest the opposite. Unfortunately, this issue cannot be satisfactorily resolved without further data collection and analysis.

Along with the trend of falling market prices (which improves food security for the rural poor), two other issues of importance are (1) the shift in tastes and preferences for rice and, relatedly, (2) the increased availability of rice in the villages (through the food for work programme, the public

distribution system, and now, the rice credit line programme). The point here is that both sorghum and rice need to be studied together in the context of overall food security concerns in these villages.

These changes in markets and choices of the villagers call for a change in our approach. How concerns of food insecurity could be addressed while depending on dry land agriculture is still a question. Here sources of irrigation are limited and dependence on dry land agriculture cannot be ruled out. Whether it is possible to provide some subsidy to sorghum so that price of sorghum becomes attractive? Whether crop diversification can be one of the solutions to this is to be explored. But the scope seems limited. Strengthening the capacity of the group in coping with ups and downs and how it can be done needs to be investigated. Given the fluctuations in incomes issue of grain on credit could be another way of addressing uncleared stocks.

- **Next Steps**

In addition to several specific tasks (basically related to collecting more information on field level processes), there are two issues that the project needs to consider, which pertain to work mentioned in the Project Memorandum but not done so far.

> **Comparing cost-effectiveness of grain storage options:** The Project Memorandum talks of exploring appropriate storage options – which includes individual bins, which has not been done so far. Also, the project memorandum states that a cost-benefit analysis will be carried out and it has not yet been decided when this will be done and by whom.
>
> **Wider set of case studies:** The project memorandum states that 'a wider set of case studies on decentralised approaches to food security and distribution implemented by other organisations in India will be undertaken. Lessons learnt from this and particularly the research with CEC will be used to develop a set of recommendations for appropriate approaches to village-level food security. While this will have specific reference to India it is anticipated that it will also highlight generic issues relevant to sub-Saharan Africa.' Again, who will do this, when and where have to be decided.

There are also two major issues that the project needs to consider, in the light of these interim findings.

Community bins or individual bins? The present findings suggest that while there is a definite benefit to poor households from being able to purchase grain from the bin during lean seasons, the sangham women prefer to grow cash crops for market sale than produce grain for storage in the bin. Further, they are not too keen on lending grain on credit to the poor, or even to sell them in small quantities, given the risks and costs of these transactions. Instead, most women seem to prefer the idea of having individual storage bins in their houses where they can protect their fallow land grain output from rodents. Also, there is a suggestion to have a community storage structure, where individuals can store their own grain in bags, using the structure as a 'bank', from where they can withdraw as much as they want, when they have a need to, after paying a certain storage fee. Both options need to be investigated, which implies broadening the scope of the project from merely looking at grain storage bins that have hitherto been considered.

Should storage be linked with cultivation programmes? : To the sangham women, the chief purpose of the community storage bin constructed in Mirzapur was to store grain produced collectively through the leased land programme. Without such collective production, the sangham women were clear that they did not see any merit in such a storage structure and would not recommend it on its own to another village sangham. The question then is whether the community bin should be 'packaged' together with land lease or fallow land development programme.

All these issues need to be urgently addressed by the project management not only to plan work for the remainder of the project period, but also to ensure that the project produces some useful results for future work on decentralised rain management for rural food security.

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The project titled 'Decentralisation of Grain Storage', funded by the Department of International Development (DFID), Government of the United Kingdom (UK), has three partner organisations: the Indian Grain Storage Management and Research Institute (IGMRI), Hyderabad, India, the Centre for Environmental Concerns (CEC), Hyderabad, India, and the Natural Resources Institute (NRI), Chatham, UK. The project began in July 2000 and is scheduled to end in April 2003.

1.1.1 Project Summary, Purpose and Research Objective

The Project Summary, as given in the Funding Application and Project Memorandum Form (hereafter referred to as the Project Memorandum), reads as follows:

> 'The unsustainable cost of public sector storage and distributions systems and persistent rural food insecurity in India has led both programming and policy initiatives to explore decentralised village-based approaches to food security. This project will contribute both practical and policy guidelines to these on-going initiatives. This will be achieved by testing and validating approaches that link the nature of the village-level institutional development with the choice and development of storage systems appropriate to these institutional needs. The work will be undertaken in the context of a village-level food security project (funded by UNDP) managed by local NGOs in association with the Andhra Pradesh Mahila Samatha Society (APMSS, part of a national programme in support of women's groups).' (p. 2)

The stated Project Purpose (*ibid*, p. 4) is

> 'Strategies developed which improve food security of poor households through increased availability and improved quality of cereals and pulse foods and better access to markets.'

The stated Research Objective (*id*.) is

> 'To examine the institutional arrangements associated with community-managed storage and distribution systems, as well as to resolve the technical requirements dictated by these systems for the storage of dry-land crops. Wider lessons will be drawn concerning decentralised, village-based approaches to the provision of food security.'

1.1.2 Project Context[5]

The context of the project is the decentralisation of food grain procurement, storage and distribution, necessitated by the unsustainable nature of the public distribution system (PDS) run by the Ministry of Food and Civil Supplies of the Government of India. In India, the PDS procures, transports and stores vast quantities of rice and wheat, as part of the food security mechanism for both the rural and urban poor in the country. But the Government of India is being forced to reconsider the structure and function of the system because of its financial unsustainability. While decentralisation to 'designated agencies' from national level to state level (including activities organised in villages or communities) (GOI, 1998a); and a shift from bag to bulk storage (GOI, 1998b) are likely to take place, policy and planning are still at a formative stage. Not only does the organisation and administration of such

[5] These two sub-sections draw heavily from pages 5 –7 of the Project Memorandum. The issues covered here are treated in greater detail in the Section 2.

strategies need to be developed, but the nature of village or community institutions also needs to be devised and appropriate storage technology has to be explored.

The NGO sector has taken a lead in initiating different models of community level food security and distribution systems in Andhra Pradesh and Karnataka. In particular, the Centre for Environmental Concerns (CEC) has undertaken a number of pilot village-level initiatives in the sorghum-growing district of Medak in Andhra Pradesh. These were undertaken also in response to the persistent food insecurity of the poor (particularly women) in these areas.

1.1.3 Project Contribution

The Project Memorandum describes the direct contributions as follows (p. 6).

> 'The core of the project is focused on providing technical support to an NGO-managed UNDP village-level food security project. In brief, the UNDP project seeks to enhance the food security of vulnerable women and their households through group-based activities. Central to this approach is the concept of enabling women to access productive resources through the cultivation of fallow lands. This will increase the production of dry land crops including sorghum. The group formation will then be used as an institutional basis for storage, distribution and sale of commodities, as well as other activities that can contribute to livelihoods of these households. The project will monitor the establishment and development of these women's groups. The organisational structures that develop will be used as a point of reference for participative activities of selecting and testing a menu of storage arrangements appropriate to these organisational needs. The storage arrangement will have to be more elaborate than those employed by poor farmers since effective marketing of grain requires longer storage periods which bring with them the danger of serious grain deterioration.'

1.1.4 Project Outputs

Three distinct outputs are articulated in the Project Memorandum (p. 7)

1. 'A set of validated recommendations for the establishment and administration of village-level institutions for food security and food distribution in the project target area.'

2. 'Validated storage technologies for sorghum appropriate to the needs of a decentralised approach to village-level food security and food distribution.'

3. 'Policy guidelines concerning decentralised, community-based approaches to the provision of village-level food security prepared.'

1.1.5 Project Activities

Each of the project outputs has a set of distinct activities (reproduced *in toto* from pp. 12-13 of the Project Memorandum).

Output 1: A set of validated recommendations for the establishment and administration of village-level institutions for food security and food distribution in the project target area.

Activities

1. Literature review of approaches to community and group food grain storage, highlighting the success and failures of different approaches. Experiences from village grain banks initiatives will be key.
2. Working with the implementing NGO, the establishment and modes of organisations of village institutions for grain storage and distribution will be critically assessed and documented.

Participatory approaches will be used to monitor the success of these modes of organisation highlighting their strengths and weaknesses.

3. At the outset it is anticipated that village grain banks will be the storage approach. However a key component of the research will be to use participatory appraisals to determine the appropriate storage approach given the patterns of organisational development of village-level institutions and the agendas and strategies of participating households. A component of this activity will be to undertake a cost-benefit analysis of alternative storage approaches. In addition, the need to include the storage of other commodities will be addressed by undertaking an inventory of storage practices and constraints.

Output 2. Validated storage technologies for sorghum appropriate to the needs of a decentralised approach to village-level food security and food distribution.

Activities

The storage needs of village groups will be assessed and appropriate locally available techniques determined using participatory methods. These storage methods will be implemented on a trial basis and the success in store management and maintenance of grain quality will be recorded over the course of a season. The cost-effectiveness of the methods will be determined. In parallel, testing and validation of alternative (non-local) low-cost, non-chemical storage technology appropriate to institutional needs and the needs of both the wet season (kharif) and the dry season (rabi) harvests will be undertaken. This would focus on the following technologies –

- Biogas generators (of which prototypes already developed for farm storage by Volcani Centre, Israel and University of Mysore, India)
- Hermetic storage
- Solar dryers, and
- Physical barriers.

Participatory approaches will be used to select, test, and evaluate promising alternative technologies along side existing storage methods.

Output 3. Policy guidelines concerning decentralised, community-based approaches to the provision of village-level food security prepared.

Activities

1. A wider set of case studies on decentralised approaches to food security and distribution implemented by other organisations in India will be undertaken. Lessons learnt from this and particularly the research with CEC will be used to develop a set of recommendations for appropriate approaches to village-level food security. While this will have specific reference to India it is anticipated that it will also highlight generic issues relevant to sub-Saharan Africa.

2. A workshop on project findings from outputs 1 and 2 will be used to develop a draft best practice strategy for the provision of village-level food security.

1.2 CURRENT STATUS

In January 2002, the project is roughly at its halfway stage, having completed a year and a half of work and with another a year and a half to go. Fieldwork has been initiated in 3 villages in Andhra Pradesh:

1. Mirzapur (N)[6] in Nyalkal mandal of Medak district
2. Kollur in Jharasangam mandal of Medak district, and
3. Thogapur in Kosgi mandal of Mahboobnagar district.

Following discussions between CEC staff, IGMRI staff and villagers, a food storage bin has been constructed in Mirzapur, and two are under construction in Kollur and Thogapur. This report presents the findings of a joint review undertaken of project activities by consultants of NRI (UK), CEC and IGMRI staff in January / February 2002.

The review consisted of two parts. One, a review of the literature produced by CEC to date and two, a brief field visit to Mirzapur to assess the socio-economic details of the operation of the constructed grain storage bin. The reason for focusing on Mirzapur is that this is the only site where a storage bin is in operation. An itinerary of the review mission is in Annexure 1.

1.3 STRUCTURE OF THE REPORT

The next section (Section 2) details the background of the project, setting out the food security issues in the project area in the general context of food grain production, distribution and access in the country. This section also describes the interventions of the lead institution of the project, the Centre for Environmental Concerns, in the project area, which provides the context for the present project.

Section 3 describes the project initiated community storage in the village of Mirzapur (B) and details the socio-economic and institutional impact of this facility on the stakeholders in the village. This analysis throws up strong link between community production by the Sangham members on leased land and the community storage managed by the Sangham.

Section 4, accordingly, presents the details of the leased land programme in the village, focusing on the socio-economic benefits to different stakeholders in the village, including non-sangham members. Food security in the village, however, is affected not only by the production on leased land, but also by the fallow lands cultivated by sangham members with help from CEC.

Section 5 examines the fallow land programme initiated by CEC, which predates the lease land programme.

Section 6 analyses food security in the village based on rice and sorghum production, wages and purchases. It studies, in particular, the relative roles of the leased land programme, fallow lands programme, and community storage, in meeting the food security needs of the stakeholders in the village.

Section 7 looks at lessons learnt by CEC over the period of interaction, food security issues in Mirzapur, and the future steps of the present project – in particular, the next steps to be taken in the remaining period of the research programme given the research agenda, and existing gaps in meeting this agenda.

[6] 'N' stands for Nyalkal, to distinguish this village from Mirzapur (B), where B stands for Bunglow**.** In the remainder of the report, 'Mirzapur' refers to Mirzapur (N) unless stated otherwise.

2. FOOD SECURITY ISSUES[7]

2.1 FOOD SECURITY AND INSECURITY

2.1.1 Hunger and Food

Hunger or lack of food is debilitating nearly one third of the world population even today. A substantial proportion of this hungry population lives in India even after the successful green revolution, which is said to have solved the food security problems facing India. This grave scenario is unacceptable. Voicing this unacceptability the Joint FAO/WHO Conference on Nutrition held in Rome in 1992 declared that hunger and malnutrition are unacceptable in a world that has both knowledge and the resources to end this human catastrophe, and recognised that access to nutritionally adequate and safe food is a right of each individual.

2.1.2 The Concept of Food Security

Food security, according to FAO (1983), implies that "all people at all times have both physical and economical access to basic food they need". The World Bank (1986) modified this formulation to "access by all people at all times to enough food for an active, healthy life…[whose] essential elements are the availability of food and the ability to acquire it". Thus, food security meant arrangements for providing physical supply of a minimum level of food grains at the national level, during all periods including those having harvest failures. This formulation also distinguished between chronic and transitory food insecurities.

Chronic food insecurity reflects continuous "inadequate diet caused by the inability to acquire food…[which] affects households that persistently lack the ability to either buy food or to produce their own". Transitory food insecurity, on the other hand, is "a temporary decline in the household's access to enough food…[which] results from instability in food prices, food production and household income – and in its worst forms, … produces famine".

A wider definition of food security incorporates quality of life indicators and holds that food security implies livelihood security at the level of each household and all members within, and involves ensuring both physical and economic access to balanced diet, safe drinking water, environmental sanitation, primary education and basic health care. (UN, 1987)

2.1.3 Food security for households and individuals

Food security is defined at various levels, global, national, regional, state, household and individual. Nevertheless, food security at the national or regional level does not necessarily indicate food security among regions, communities, households and individuals. Food security is particularly concerned with people's immediate risks of not having adequate access to needed food. Household food security is the capacity of a household to access a stable and sustainable basket of food when it needs it. This requires putting in place necessary policies and actions to make adequate food available as well as accessible at the household level across seasons and transitory shortages (IFAD, 1996, pp. 3-4).

The food security status of individuals in a household is determined by a variety of factors, including resources commanded by the households, levels of farm and non-form production, household income, household and individual consumption, and individual nutrition.

[7] This section draws on the Literature Review on Decentralized Food Security and Grain Storage produced by Thimma Reddy of CEC.

Further, household level food insecurity are affected by ownership of poor quality of land or no land, distress sale of productive assets, livestock and valuable assets like jewellery, indebtedness, heavy dependence on wage employment, few income earners in the family, accepting attached labour positions, migration in search of work and using inferior quality of food (Chung *et al*., 1997). Clearly, most of the indicators of food insecurity at the household level are linked to poverty.

2.1.4 Food Insecurity and Poverty

Poverty is a major determinant of food insecurity, since physical availability alone does not ensure economic access to food. The poor do not always have adequate income to secure their access to food, even when food is available in local markets. For this reason, it is argued that satisfactory production levels and stability of supplies should be matched by a reduction in poverty and increase in the effective demand to ensure economic and physical access for the poor (George 1999:466).

2.1.5 Efforts to Combat Food Insecurity

Since the majority of the poor live in rural areas, and since most of them are small farmers or agricultural labourers, macroeconomic policies in general and, agricultural policies and poverty alleviation programmes policies in particular, assume special significance in efforts to combat food insecurity. In addition, however, a number of direct interventions such as public distribution of food grains and feeding programmes are relevant in the context of achieving household food security.

2.2 FOOD SECURITY ISSUES IN INDIA

2.2.1 Food Grain Production

The Green Revolution of the 1960s catalysed the rate of growth of food grain[8] production during the 1970s and 1980s. Food grain growth, however, declined in the 1990s, with the growth of rice production, in particular, falling from over 4 percent during 1980s to 1.68 percent during 1990s. Wheat production and that of coarse cereals also declined, the decline was not so pronounced as in the case of rice. The 1990s also was stagnation in the growth of area under food grain (a major driver for growth in the 1970s) as well as productivity growth (the major factor contributing to the increased output in the 1980s). The declining trend in the growth rate of food production during 1990s has serious consequences for national food security. In fact the growth rate of food grain production during the 1990s has been close to the annual population growth rate, which implies a stagnant per capita production level. (George.1999: 471-2).

Per capita supply of food grains is often taken to be an indicator of food security at the household level. However, such aggregation can mask inequitable accessibility to food for various sections of population, particularly the poor. In India, there are sizeable proportions of consumers with inadequate calorie intake in both rural and urban areas. In 1993-94, for instance, 42 percent of the rural Indian consumers and 48 percent of urban Indian consumes received less than 90 percent of the required calorific norm. The deficiency is acute among the poor.[9]

2.2.2 The Public Distribution System and 'Urban Bias'

The Public Distribution System or the PDS as it is popularly called is an important part of Indian government efforts to address the food insecurity of its poor. Beginning as a means to provide price stability for urban consumers and to contain speculation in food grains market through building food

[8] Food grain refers to cereals and non-cereal food crops (such as edible oilseeds and pulses). Cereals can be further divided into fine cereals (e.g., rice and wheat) and coarse cereals (like sorghum, bajra, ragi, etc.).
[9] In rural areas 89 percent of those with less than 70 percent required calorie intake had monthly per capita expenditure levels below Rs. 265 (George, 1999, p 479).

reserves, it was only in the late 1980s that the PDS was re-oriented to address the needs of the rural poor. Though rural areas produce the food grains, the rural poor were not getting enough to eat because of absence of purchasing power in their hands. However, urban areas have continued to be the main beneficiaries of the PDS, even in years of drought, which are basically a rural phenomenon (Venugopal.1992: 100).

2.2.3 PDS and the Rural Poor

Despite the late start and the urban bias, indications are that the PDS is not even working well in rural areas: off-take in the PDS through fair price shops in rural areas, which should be a good indicator of whether or not the poor are eating better, is not registering a sustained rise. Problems noted by reviewers (e.g., Jha, 1991; Venugopal, 1992, Dev, 1996, George, 1999) include the following:

- Uncertain and inadequate supplies, due to a mismatch between people's actual needs and supplies,
- Diversion and sale by PDS dealers of (more than a third of) the food grains meant for the PDS
- Inadequate infrastructure facilities
- High overhead costs
- High and unrealistic margins allowed for fair price shop dealers.
- The exclusion of a large number of poor and
- The disproportionate flow of benefits to the rural non-poor.

The conclusion, by and large, is that the India's public distribution system is extremely ineffective in tackling the food insecurity of the rural poor.

2.2.4 Rising Food Stocks and Household Food Insecurity

Increasing food availability at national level is a necessary condition for achieving household level food security, but it is not a sufficient condition. Increased agricultural production does not necessarily translate into a more stable, sustainable, adequate food consumption at household level.

An important paradox of the present PDS is that there is mounting hunger and recurring starvation deaths even when food grain stocks held by the government are increasing. By middle of the year 2000 the Government of India had nearly twice the buffer stock norm (28 million tonnes of food grains as against the overall buffer stock norm of 15.8 million tonnes). Yet, the PDS is meeting only about 20 percent of the food requirement of the bottom 20% of the rural population. The rest of the poor are forced to buy food at high prices from the open market.

Clearly, therefore, while India may have achieved food security at the national level, it has not yet achieved food security at the household level.

2.2.5 Seasonality of Household Food Insecurity

Food crises of the rural poor tend to be seasonal. 'Lean' seasons, which do not offer income generation or employment opportunities tend to affect them more than the rest of the year. The stressful, lean season may span from a few days in a month to a few months depending on rainfall, agricultural activities and work availability. Also, if food grain is scarce, the climbing prices put food out of the reach of the unemployed poor.

Such seasonal fluctuations in food availability are most prevalent in drought prone semi-arid tracts, and the poor use many different coping strategies. Those with small tracts of land usually give priority to food crops like sorghum. Others try to build up stores of assets, grain and livestock during good seasons. Most resort to familial and cultural relationships (or 'social security nets') to help them tide over the season. Migration to urban areas in search of employment, the pawning or sale of assets, and,

in dire circumstances, sale of farm land, wives or children have been known to take place.[10] However, it is a succession of lean seasons that it leads to extreme adverse effects like starvation deaths.

2.2.6 Employment Guarantee Schemes

Food aid to vulnerable persons and food for work programmes are important elements of a relief programme to tackle adverse seasonal conditions. The positive relationship between poverty and person day unemployment suggested by some estimates imply that reducing under employment will increase the purchasing power of the poor population and increase their food security. The state of Maharashtra has much lower person day unemployment as compared to West Bengal and this could be attributed to employment guarantee scheme (EGS) in Maharashtra. (Dev 1996)

Radhakrishna and Hanumanta Rao (1994) estimate that if a part of the food grain (PDS) subsidy were used for rural employment programmes and the remaining for augmenting investment, both gross domestic product as well as the incomes of the poor would rise, even after allowing for 50 percent leakage and 50 percent efficiency of assets created under rural employment programmes (pp. 30-31).

While the PDS has a wider coverage than the EGS, the secondary (employment generation) benefits of the EGS and the severe leakages of the PDS indicate that the EGS may equal or score over PDS in reaching the poor. However, providing employment per se does not solve the problem of poverty. Though EGS has helped to increase the incomes of the rural poor in Maharashtra, the poverty of casual labourers is still quite high. At existing wages, many poor households (such as agricultural labourers) may not reach the poverty line even if they work 300 days in a year. This indicates that there is a need to enhance the purchasing power of the poor, apart from increasing employment opportunities (Dev, 1996). As the adverse season is characterised by low availability of food and high prices, there is a need for measures to stabilise prices of food grains at reasonable low levels so as to keep them accessible to poor households. In addition, diversification and wider choice of crop, livestock and income earning activities are required to reduce the risk of adverse seasonal effects.

2.2.7 Women and Food Security

Women have been described as the gatekeepers between households and individual members in decisions regarding food production, health and nutrition, and are seen as providing the main entry point for addressing household level food security and nutritional objectives at household level (IFAD, 1996, p. 9). Women account for as much as 70 to 80 percent of household food production in Sub-Saharan Africa, 60 percent in Asia, and 45 percent in Latin America. They also perform significant work in food processing and storage. Further, women's incomes are more strongly associated with improvements in children's health and nutritional status than those of men, as women tend to spend their income disproportionately on food for the family. Given equal access to resources and human capital, women farmers can achieve yields equal to or even higher than those of men. Women's capability could be increased by enhancing their access to resources, technology, and information through innovative credit programmes using non-traditional forms of collateral such as women's groups, or through effective agricultural extension services to women.

While the burden of coping with food insecurity usually falls on women and children more than the male members of the family, studies have shown that female-headed households are more resilient to seasonal stress and calamity (Jiggins.1986: 16).

Further, women are important beneficiaries of Food for Work programmes. Janice Jiggins' studies of the Employment Guarantee Scheme in Maharashtra, India, and the Food for Work programme in Bangladesh show unexpectedly high proportions of women turning for work (Jiggins, 1986, p. 14).

[10] See, *inter alia*, Longhurst, 1986.

2.2.8 Access to Food: Entitlements and Employment

As the discussion on employment guarantee schemes indicated, household food security is perhaps more closely linked to access to food rather than to food grain availability *per se*. Amartya Sen (1981) argued that people could starve in the midst of plenty of food owing to a collapse in their means of command over food. He pointed out that undue emphasis on aggregate food availability diverts attention from more fundamental issue of how particular individuals and groups of people gain access to and control over food.

A survey conducted by K. R. Venugopal in 13 villages spread over four states in 1985-86 corroborates this analysis. According to him, " Admittedly, not every one in these villages goes hungry. But those who depend upon wage employment – agricultural labourers, artisans and even those with landholdings if they happen to live in areas that have no assured irrigation facilities – do remain hungry, sometimes entire households, at other times the female children and, almost always, the women folk in these households. The number of days entire household or some of its members go hungry depends upon the number of days of employment available in the village or outside it, which, except in the canal irrigated villages, is always uncertain. It also depends upon wage levels" (Venugopal, 1992, p. 27).

2.2.9 Adverse Impacts of Cheap PDS Rice

A significant impact of the food grain procurement system of the Government of India is the shift in cropping patterns. The PDS largely depends on the food grain procured from the Green Revolution areas of Punjab, Haryana, Western Uttar Pradesh, coastal AP and some districts in Tamil Nadu, which are all areas where agriculture is canal irrigated. In other words food insecurity alleviation programmes rely heavily on irrigated and input intensive agriculture, where the cropping pattern has changed in favour of fine cereal crops like rice and wheat because of the remunerative procurement prices offered by the Government.

The major impact of this shift is the severe neglect of rainfed dry land agriculture, which is the most common use of agricultural land in India (more than 60% of agricultural land use in Andhra Pradesh, for instance). Traditionally these lands are used to produce food crops like sorghum, pearl millet, and finger millet. Rainfed agriculture in such resource-deficient semi-arid areas has historically been characterised by natural resource scarcity, variability of weather, and high economic risks and uncertainty: scarcity of water for even life-saving irrigation, proneness to drought and other weather-related damage, low capacity for investment, low land and labour productivity, which result in low and uncertain production and consequently, small and varying profit margins. The further deterioration in the economic viability of rainfed agriculture has drastically affected the livelihoods and hence food security of the people in these areas.

In addition, the availability of cheap rice through the PDS (due to high subsidies) has led the poor in rainfed farming areas to shift from eating their traditional food grains to eating rice. The reduction in demand for these food grains lowered their market prices. Farmers reacted to shrinking profit margins in different ways. Some shifted to cash crops like groundnut, cotton and sunflower. Those with lands suitable for growing rainfed crops like sorghum but not commercial crops like cotton kept their land fallow. Many were forced to migrate in search of employment. Unsure employment opportunities, high costs of credit and low wages, however, have kept these people food insecure and dependent. Cheap rice supplied under PDS is sufficient only to meet about 20 percent of the food needs of a household, and for the remaining they have to depend on the open market where prices are high during the post-harvest lean period. On the one hand because of spreading fallow lands and declining agricultural income and on the other hand high cost of food grain made the food security position of poor households miserable.

2.2.10 Limits to Irrigated Agriculture

Despite the adverse implications of the PDS for rainfed farming, rainfed agriculture is crucial to Indian food security. Currently, it sustains 40 percent of the human population and 60 percent of the cattle, and it also contributes 44 percent of total food production in the country.

On the other hand, the area under irrigated agriculture is growing by less than one percent, limited by environmental constraints like spreading salinity and alkalinity of irrigated lands, and the vast financial resources needed to take up irrigation projects. Crosson and Anderson (1992) argue that, within the existing knowledge regime, it is unlikely that irrigation can expand enough to accommodate more than a small part of the future food demand. After documenting the slow down in the rate of grown of irrigated land in developing countries, Stewart *et al* conclude by saying, " rainfed agriculture will have to provide an increasing share of the expanding demand for food in the developing world".

Even if sufficient food is produced, however, storage losses eat into food availability and can undercut efforts to bring about food security.

2.3 PROBLEMS IN GRAIN STORAGE

2.3.1 Costs of Inadequate Storage

Proper and adequate storage and maintenance of produced grain is as important as producing adequate grain. While harvesting losses tend to be higher in developed countries and lower in developing countries, as harvesting is done mostly by hand picking, rudimentary storage and processing methods, and inadequate storage facilities result in high post-harvest losses in the latter. One estimate puts food grain wastage costs in India at Rs. 230 billion (US$ 5.75 billion) per year.[11] While improper technology leads to transportation losses, there are significant losses also due to the lack of infrastructure like storage and harvesting at the farm level (Ramesh, 1999, p.37).

Inadequate storage facilities at the farm level are particularly problematic in India for two reasons: Farmers tend to retain a substantial proportion of their food crop output with them, either for self consumption, or for seed purposes or for feed or for payment of wages in kind; and secondly, farmers with inadequate storage facilities are usually compelled to sell their grain soon after harvest, when prices are low, for fear of it spoiling later.[12]

2.3.2 Types of Storage Losses

Storage losses can be divided into several categories. Quantitative loss is physical loss of substance (shown by a reduction in weight or volume) and so can easily be ascertained. Qualitative loss however is a more difficult to assess but can often be determined by comparison with locally acceptable standards. Nutritional loss may be a combination of both. There can also be a loss of wholesomeness (or hygienic loss) due to contamination of the grain in the store, whether of microbial, insect or small animal origin. Aside from health considerations, contamination can lead to economic loss because less money will be received for grain of poor quality (O'Kelly, 1979, p. 86).

2.3.3 Traditional Storage in India[13]

Indian farmers use several types of grain storage structures, most of which are traditional. Six types of storage are differentiated below, including, straw storage structures, bamboo/reed structures, earthen

[11] The figure is from a report entitled "Food and Agriculture: Integrated Development Action" by consultants McKinsey & Co and the Confederation of Indian Industry, which is quoted in Ramesh (1999).
[12] Never the less, a major cause for quick sales after harvest is the urgent need for cash to pay back loans.
[13] This sub-section draws from Ramam, 1989 and O'Kelly, 1979.

structures, masonry structures, underground structures and bag storage. Each has different storage capacities, life spans, advantages and disadvantages (see Annexure 2 for detailed descriptions).

Most traditional storage structures are cheap and economical unlike masonry storage structures. Further, farmers and village artisans are familiar with construction techniques of almost all traditional storage structures. Some traditional structures protect grain against infestation either through aeration or airtight sealing. However, most traditional structures are not insect proof, moisture proof, rat-proof, and some (e.g., straw roped structures and bamboo/reed storage structures) are not fire proof.

Farmers use traditional practices to tackle insect infestation in grain, and a common method is to keep neem leaves and ash in the grain. While in some villages this method is followed both for food grain and seed grain, it is usually followed only in storing seed grain since treatment for grain meant for immediate consumption alters the taste of the grain (makes it turn bitter). In case of either pest attacks or moisture, farmers usually dry grain in sun. In the case of moisture, they take the added precaution of drying the storage area also.

While some precautions can be taken to reduce the risk of fire (wherever relevant), farmers are largely helpless against rodents. Prepared bait is effective to some extent in the case of smaller ones, but they are of no use against bigger rodents. Farmers also keep thorns at the bottom of bamboo or reed storage structures to deter rodent attack, but this is not very effective.

2.3.4 Improving Traditional Storage

The Indian Grain Storage Management and Research Institute (IGSMRI) has done extensive work on grain storage problems in India and has come up with suggestions to improve the traditional methods. Some of these are given below (from GoI, 1996, p. 105).

Table 2.1: Improvements Suggested for Traditional Storage Structures

Problem	Type of Structure	Suggestions
Rodent attacks	Straw-roped structures	A concrete floor or reinforced brick floor to prevent rat entry from below. To avoid rat crawling or jumping into the structure a smooth obstruction of 600 mm is provided, the obstruction could be a metallic sheet, RCC rings or reinforced brick wall.
	Bamboo/reed structures	*Indoors:* A wooden platform with metallic cones or metal base. *Outdoors*: A masonry platform with stone slabs and an over hang of 300 mm all around to prevent rat entry. For very old structures, a simple cement plaster on the outlet and GP sheet roof.
	Masonry structures	Ferro cement technique - plastering with cement and sand mortar (in a 1:2 ratio) on wire mesh.
	Underground structures	A simple brick wall of 115 mm thickness.
	Earthen structures	Either ferrocement technique (see above) or a skirting with cement mortar and baby chips
	Bags	No effective technique, except to keep bags where rats cannot access them
Moisture	All structures	A waterproofing compound or 700 G or 1000 G polythene sheet.
Insects	Bags	Chemical spraying, especially to control cross infestation
	Other structures	Plaster the structure with a mixture of mud and cow dung.

2.3.5 Alternative Storage Methods

Storage Bins

An important alternative storage method developed by IGSMRI is the 'Pusa' bin. One type of Pusa bin has burnt bricks for the floor and lower part of the walls while the rest is made of mud bricks. The walls and flat roof are double layered with a layer of plastic sheeting inserted between the two brick layers, which protects the grain from moisture and prevents air from entering. A separate thatched roof around the top protects it from sun and rain. Another design of Pusa bin has double masonry walls each 4.5 inches thick with polythene sheeting in between. The outer layer has steel reinforcement and the sides are plastered with cement. The Institute has also produced metallic bins. Metallic and non-metallic bins are designed for indoor and outdoor purposes.

The distinct advantages of using these modern storage structures are the following (GoI, 1996, p. 109):

- Large quantities can be stored safely
- Storage losses are substantially minimised
- Quality degradation can be controlled
- Grain can be stored for longer duration
- Seed grain is stored better
- These bins provide better returns to investment

Hermetic Storage

In order to minimise use of pesticides hermetic storage methods are recommended, particularly when large quantities of grain are stored. Hermetic storage are said to offer the most viable non-pesticidal alternative for insect control (Caliboso and Sabio, 1999, p. 61).[14]

Integrated storage past management

A multi-disciplinary strategy to solve problems of grain maintenance during storage recommends adherence to quality standards during procurement (to ensure sound initial grain quality), a good physical storage structure, maintenance of maximum levels of storage hygiene and sanitation, application of pesticides in a most cost effective and efficient manner, and the promotion of non-chemical measures. Effectiveness depends on strong commitment on the part of the management for the integration of all measures (Sadik, 1999, p. 103).

2.4 GRAIN BANKS FOR FOOD SECURITY

The problems with providing food security to the rural poor through a centralised PDS have led to many reviewers arguing for alternative approaches to tackling food insecurity through local initiatives and local participation based on the principles of efficiency, equity and environmental conservation. (George.1999: 486-87; Gopal, 2000, 2001).

One alternative suggested to the PDS is based on the fact that labour households account for a large proportion of the food insecure population. The argument is that increased employment opportunities will make substantial contributions towards expanding the economic access of this group and improve its food security. Therefore, integrating the PDS with employment generation schemes will provide a

[14] However, the basic manner to reduce the use of chemical pesticides remains the use of biological control methods in the general area. Several reports suggest that there are a large number of natural enemies of pests in the Asian region that can be used for biological control. More efficient control of insect pests could be achieved by 'augmentative release of selected mass cultured natural enemies. But the use of natural enemies for biological control requires extensive studies to identify species and the hosts (Nakakita, 1999, p. 73).

'self-screening method' for the rural poor. The suggestion arising from this line of argument is that integrating employment programmes and targeted food subsidies will yield substantial welfare gains (Radhkrishna and Hanumanta Rao, 1994, p. 21).

Nevertheless, it must be clear from the preceding sub-sections that household food security involves decentralised methods to provide adequate food grain production, safe storage, and effective access and entitlements to food.

Several local NGO-led initiatives seek to tackle these different aspects of food security, and three of these are explored further below.

2.4.1 Grain Banks: The Janaseva Initiative

An important attempt towards an alternative food security programme is the grain bank system being implemented by the Janaseva Mandal in the state of Maharashtra. It is guided and supported by AFARM of Pune, and is being carried out by 11 groups in different *Adivasi* (tribal) villages.

The agricultural practices of the Adivasis are controlled by the behaviour of the monsoons. Both failure of rains and excess rain affects them adversely, with these uncertain adverse conditions often approximating famine conditions. In such times, almost all sections of the Adivasi community face deficiency in availability of food grains. Their lack of entitlements force the Adivasis into debt traps in lean season prior to the first monsoon harvest since money lenders lend cash and grain at prohibitive rates of interest.

The grain banks programme of the community is designed to make available food grain to Adivasis during the lean season, by lending them food at affordable interest rates. The grain banks, thus, supply the nutritional needs of disadvantaged sections during a period when they do not have the resources to buy food, and help them avoid the debt traps of profiteering moneylenders. Adivsis also use the grain banks to get affordable rates for their produce. Another benefit of the grain banks is that this alternative channel of grain availability increases the bargaining power of the tribal farmers. Besides this, surplus grain available with the grain bank can also be used to provide additional work opportunities, thus reducing distress labour migration. Grain banks offer surpluses for community development work as well as for individual requirements.

Under this programme in the beginning each member contributes 35 kgs of grain as their initial contribution. During the lean season (often the monsoon season) members take grain on loan from the grain bank and return it after the harvest season with 25% interest. Every year they also increase their contribution shares and thus gradually the amount of grain in the bank increases. Loans are given in proportion to contributions, but the group considers requests from members in dire need.

Currently the amount stored in the grain bank is not very much, but the hope is that it will increase gradually, with creative solution to the problem of low contributions.

The grain collected under the grain banks is being stored in the village type of wattle and cow dung plastered bin. These are inadequate for the expanding membership and volume of grain being stored in the grain bank. The Janaseva Mandal in association with the IGSMRI of Jabalpur is trying to design and construct more adequate and efficient storage bins.

2.4.2 Grain Banks: the AP Participatory Tribal Development Projects

One review of the Andhra Pradesh Participatory Tribal Development Project, financed by IFAD, Rome, found that instead of locally produced coarse food grain crops (to which the targeted populations are accustomed), irrigated rice was being stored in village grain banks (K.Lalita *et al*, 1995, p. 51). Also, the project focus on introducing cash crops and irrigated paddy to create more access to cash income reduces the importance of self-sufficiency in food production and leads tribals

away from their subsistence economy. Overall, however, the review found that, at present, these grain banks are almost non-functional in most of the villages covered by this programme.

2.4.3 Food Entitlements: The Rice Credit Line Initiative[15]

A recent initiative of CEC is to arrange for women's self-help groups (SHGs) in Medak district, Andhra Pradesh, to access rice meant for the government's drought-relief food distribution scheme. After initial resistance from government officials and consequently a representation to the Chief Secretary of the state government of Andhra Pradesh in late 2001, the state government agreed to instruct officials of the Mandal Civil Supplies Department, to issue 5 tons of rice at the subsidised price of Rs. 6.40 per kilogram (kg) to women's groups in KV Palle Mandal in Chittoor District, AP. The women agreed with the community to sell the grain on credit in the village at Rs. 7.00 per kg, to cover the costs of interest, transportation, and management and to generate some modest savings for the women's group (Re. 0.40 per kg of rice sold). The details of the scheme are as follows:

- The women's group pays the Mandal Civil Supplies depot up front, collects the rice, and transports it to the village, where it is immediately given on loan to villagers

- Each household had an entitlement to borrow up to 50 kgs of rice per month and each community had to choose its own repayment model from the following three choices:

  I. Draw rice for six lean months and repay over twelve months.
  II. Draw the first instalment of rice, repay the loan and then take fresh credit
  III. Draw rice each month and repay in instalments within the month

  Most villages, especially those with high out-migration, chose the third model. Interior villages preferred the second model, while a few villages adopted the first model.

- Households repay the women' group, and group then approaches the Civil Supplies Depot for more supplies.

The scheme started in 2001 with 5 tons. Following cent per cent recoveries, the government increased the disbursement to 15 tons the next month. Following requests from neighbouring villages to the Government of Andhra Pradesh to included the in the scheme, and further representation from CEC, the Government ordered 10,000 tons of rice earmarked for drought affected areas to be given to women's' groups on a one year credit. The Society for Elimination of Rural Poverty (SERP), an autonomous body promoted by the AP Government was appointed the nodal department and CEC is involved in this expansion.[16]

2.4.4 Stimulating Local Production: Fallow Land and Leased Land Programmes

One of the solutions to overcome the lack of entitlements is to initiate "a process by which local groups or communities organise themselves with varying degrees of outside support so as to apply their skills and knowledge to the care of natural resources and environment while satisfying livelihood needs" (Pretty and Guijt. 1992, p. 22).[17] The CEC pioneered an initiative to provide a decentralised,

[15] This sub-section draws on Gopal, *undated* (a).

[16] The convener of the Raithu Sahaya Committee, a citizens body constituted to provide relief following suicides by young cotton farmers in the late nineties, and KS Gopal of CEC were invited by George Fernandes, then the convener of the National Democratic Alliance (NDA) to discuss the experience, which was followed by a meeting with Shri. Shanta Kumar, Union Ministry of Civil Supplies, Government of India, who agreed to implement such grain banks using existing food stocks for drought areas in the country.

[17] While endorsing the need for such community-based development, some analysts note that serious attention to social difference and its implications have been absent from this debate (Leach *et al*.1997: 5-6). They stress the need to recognize that communities are not bounded homogeneous entities but are in fact socially differentiated

rainfed dry land agriculture based and women centred food security programme to women farmers in Medak district in Andhra Pradesh, is a step in this direction. CEC provided credit to women farmers in order to cultivate their own fallow lands as well as land leased from other villagers. But before describing this further, it is helpful to describe the main characteristics of the project area.

Project Area

More than two thirds of the cropped area in Medak district in Andhra Pradesh has a single rainfed crop and a third has a second crop from residual moisture. While nearly 15 percent of the households are landless more than 50 percent of the households belong to small and marginal farmer households. While small and marginal farmers own about 30 percent of the agricultural land large farmers who form 11 percent of the total households own more than 35 percent of the agricultural land. Farmers depend solely on the monsoons for getting a good crop and only during good crop years Farmers are assured of some food availability through out the year. Sorghum forms the staple food for the people in this area.

The introduction of two rupees per kg rice as a part of the PDS scheme in early 1980s saw many poor families shifting towards this cheap rice. As a result, demand for sorghum a coarse cereal declined, leading to a change in the cropping pattern: Cash crops like groundnut, cotton and sunflower replaced coarse cereals like sorghum. Further, since cheap rice supplied under PDS was only sufficient to meet about 20 percent of the food needs, households had to depend on the open market with its high prices for the remaining requirement. Thus, on the one hand there was spreading fallow lands and declining agricultural income, and on the other hand, households had to pay high costs to meet their food requirements. On the whole, poor households faced high food insecurity.

The Initiative[18]

It was in these circumstances that CEC placed before the women's sanghams in several villages in Medak district the option of taking up the cultivation of the fallow lands to grow coarse cereals like sorghum. Initially, the members of the women's sangham opted for a strategy of extensive cultivation and phased reduction of fallow lands under their ownership. Apart from this, the women sanghams also began to lease private lands belonging to larger farmers (who found it unprofitable to cultivate them) and began cultivating sorghum and other crops that form the basket of essential food crops. As a part of this food security programme they also took up grain bank programme to insulate themselves from the market fluctuations. (Gopal and Sashikumar, 1997, pp. 219-229)

Impacts of the Initiative

This programme facilitates the adoption of cropping patterns and agricultural practices suited to sustainable land use, thus helping to arrest the growth of high-risk commercial crops and promote food crops. Thus, the alternative system undertaken by women's sanghams uses local resources, promotes watershed approach within the reach of the poor farmers and enables women to have a say in agriculture.
But perhaps more than these, it helps regain women's control in dry land agricultural management, and enhance wage and income opportunities for women. Further, working as a unit on leased lands has strengthened co-operation, and also encouraged them to meet, discuss and take decisions regarding the land, which has helped them evolve into decision-makers (and not mere decision receivers.) and enhanced their confidence in their ability to manage their own affairs.

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and diverse, and hence a need to understand the links between differentiated environments and differentiated communities.

[18] Note that this section describes a broader initiative than the case of Mirzapur detailed in this report, and hence the details of actions and reactions may vary from what is reported in subsequent pages.

Another significant impact of improved availability of rice in the village community is the satisfaction among the women of the households. As it is the women who cook and serve food, a lack of food grain in the house, especially when children were hungry or when a relative came calling, was a source of considerable mental anguish. Also, internal family relations improved with the absence of the tension of finding food for the next meal, and women's role in decision-making within the family was enhanced. With time saved from having to find food for the family, women now had enough time to attend group meetings and group activities.

Further, the ready availability of rice at affordable prices meant that households did not have to approach the local moneylenders for credit at usurious rates. This reduced dependence improved their bargaining power with both traders (to resist cheating in measurement) and farmers (to ask for higher daily wages). Less spent on food has also meant that households have been able to save money for future expenses.

Scope for Growth

Elaborating the validity of such an approach Gopal and Sashikumar (CEC, 1997) explain that fallow lands in Medak district were 5,83,085 acres while the net sown area was 10,38,009 acres in 1990-91. Thus fallow lands account for over 50 percent of the net sown area. To meet the needs of the 2,56,158 families covered under the PDS in the district, the requirement is about one hundred thousand tonnes. They thus estimate that a procurement of 300 kgs per acre of sorghum coupled with annual crop rotation of sorghum with pulses or oil. Further, the investment needed for this programme, which enables long-term food security, is less than three years subsidy of the rice scheme. But there are problems with storage.

Problems with Storage

Under the food security scheme pioneered by CEC, women farmers who participated in the programme contribute sorghum to be stored. This was to be distributed among the needy during lean season. This setting up buffer stock of food grains is also an important activity envisaged under this programme. This is meant to meet the food needs of the member families in lean seasons during which employment is not available and also during which period prices of food grains shoot up. This programme is managed by the Food Security Committee (FSC) consisting of five members and elected by participating women farmers from that particular village. The FSC decides the quantum of grain to be contributed by each member, methods to be followed for storing this grain and when and how to distribute the collected grain.

The problems regarding sorghum storage are addressed by the FSC. Initially the collected grain was stored in the house of one of the members. Because of the inadequacies in the storage of food grain a good proportion of food grain is lost due to dampness as well as due to rodent menace. As the methods that they are aware of in tackling these problems are not successful they searched for alternatives.

The Present Project

Problems with decentralised grain storage for sangham women in Medak district was the entry point of the present project, which aimed to provide technical assistance to the women to reduce losses in grain storage. The results of this engagement are more fully described in the following sections.

3. BACKGROUND: CEC AND MIRZAPUR

3.1 INTRODUCTION

The demand for a community storage bin was a catalyst for the formulation of the project. However, it is important to see that the project entered a time stream of engagement by CEC in the selected villages. The project, nevertheless, confined itself to a core of three villages:

- Mirzapur (N) in Nyalkal mandal of Medak district
- Kollur in Jharasangam mandal of Medak district, and
- Thogapur in Kosgi mandal of Mahboobnagar district.

The results of the review mission are confined to the bin in Mirzapur district because as of now only this bin has been completed and is operational. This section, therefore, starts with a history of CEC interventions in CEC.[19]

3.2 BACKGROUND ON MIRZAPUR

3.2.1 Location

The 'N' in Mirzapur (N) stands for 'Nyalkal' as it is a village located in Nyalkal Mandal. It is a roadside village on the Metlakunta - Allahdurg road, around 3km away from the Mandal headquarters. It is a minor gram panchayat.

3.2.2 Neighbouring Villages

On its eastern side of the village is a hill called "Rachanna Gutta", on top of which there is a temple called "Rachanna Temple". People of the village believe that he is the protector of that village. To the south of Mirzapur is the village called Mungi, and to its north are the villages of Vanampalli and Tekur, all in a radius of 3 to 5 km.

3.2.3 Social Strata

Mirzapur has around 800 voters and around 300 households. It has people belonging to different sections, religions and caste groups. The Reddys dominate the village in all aspects - social, economical and political, even though they are not a large number. All the fertile land is concentrated in their hands and the other lower castes have only less fertile lands. The village is covered mostly by less fertile soil (*Garubu*) though there is some presence of black soil (*Nalla Regadi*).

The Domination by the Reddys

Members of Bhaskar Reddy's family have been elected the Sarpanch of Mirzapur for the past 30 years Although a an SC woman was elected as Sarpanch on the basis of the SC reservation quota the last time, in the recent elections, Bhaskar Reddy was elected sarpanch unopposed.

[19] For a chronological account see Annexure 3. Profiles of the other two villages of Thogapur and Kollur are in Annexures 4 and 5.

3.2.4 Social and Economic Infrastructure

The village has a community hall, panchayat building and a primary school. For drinking water, the village has a piped water system and 4 hand-bores, in addition to which agricultural bore wells are also used. As it is a small village, a weekly village market (*shandai*) does not take place here, and the nearest *shandais* are in Nyalkal on Wednesday and Hadnoor on Saturday.

Most of people in this village are poor and illiterate and because of poverty parents cannot afford to send their children to school and need them to help earn a living.

As in most villages in the area, Mirzapur is an agricultural village in that most of its inhabitants derive a livelihood from activities related to agriculture. Small and marginal farmers, as well as those who do not have agricultural lands of their own, work as agricultural labourers in other farmers ' lands, particularly where irrigation facilities are available. Male labourers earn around Rs. 40 per day, while women earn half that amount. But since the region receives scant rainfall, and irrigation is a problem, most cultivation is rainfed kharif. Only few farmers have sufficient access to irrigation to grow a second crop. Agricultural work therefore is not available round the year, because of which labourers are forced to migrate every year in search of additional employment.

3.2.6 Cropping Pattern

Most farmers grow a variety of crops in the rain-based kharif season, sowing in June/July as the rains begin and harvesting in October/November. However, when rains are delayed (as in last year), harvesting takes place in December/January. Kharif crops include paddy, sorghum (, black gram, pigeonpea, and green gram.

The rabi crop is sown in February and harvested in April/May, and the crops grown in this period include wheat, white sorghum, safflower, chickpea, linseed and coriander.
Wheat and paddy are grown on the 10-15% of cultivated land where irrigation is available, with some farmers also growing sugarcane as an annual crop.

The staple food of the villagers is rice (purchased mostly from outside the village) and sorghum.

3.3 HISTORY OF CEC INTERVENTION IN MIRZAPUR[20]

3.3.1 The Mahila Sanghams (Women's Self Help Groups)[21]

CEC held a brainstorming session in early 1994 with the village women to try and convince them to form a Women's Self Help Group (*Mahila Sangham*) in their village. To give them added incentive, they organized a visit to the neighbouring village of Ibrahimpur, to see the improvements there since the formation of a Women's SHG in that village. Impressed with what they saw, the women of Mirzapur decided to start an SHG (*sangham*) of their own.

But they faced opposition from outside and within their households. Reddy landlords in the village warned them not to form a mahila sangham, threatening that they would not employ them in their fields. Male members of the households of these women also objected to their forming or joining a mahila sangham. The women, however, stuck to their resolve to form the Sangham and, with the support of the CEC, went ahead and formed the first women's' SHG with 33 members in late 1994. They opened a bank account and began weekly savings of Rs. 5 per member.

[20] For more details of the intervention of this connection, see CEC (undated).
[21] A women's Self Help Group or SHG is called a Mahila Sangham in villages, and each group often has a distinct name (e.g., Gautami Mahila Sangham). The terms SHG and Sangham therefore used inter-changeably.

For the CEC, these initial two years were difficult, since holding this group together posed a big challenge. But they managed to win the confidence of the village women and after 1997 development was faster and easier.

By 1998, the total savings had risen to Rs. 48,000 out of which 20 women received a loan of Rs. 500 each, which amounted to a total of Rs. 10,000.

The Start of the Women's Sangham
The women of the Sangham had this to say about the birth and development of their Sangham: "It was like planting saplings in the land where nobody was there to take care. But with intervention of CEC this sapling got good nourishing and now it has become a healthy plant. If this nourishing continues even in future definitely this plant will become a huge tree giving shade to others".

At present there are four Women's Self-Help-Groups (*Mahila Sanghams*) in the village, called Gautami, Vennela, Malle and Tulja Bhavani Mahila Sanghams. These groups emerged from splitting the existing sangha in four, which was necessary in order for them to qualify for support under the UNDP' South Asia Poverty Alleviation Programme (SAPAP) which limits the size of a *sangham* to 15 persons. Two of these groups have women from the Mala caste, one has women from the Madiga caste and other from a Backward Caste (BC). Thus, only women from the upper Reddy and Balija castes are not represented in these Sanghams.

3.3.2 Rice Loans

In 1996, the women reported hardships in finding the money to buy rationed rice. The system operating in the village was that the village rice dealer would get rice supplies once a month. All those who had cash in the house at the time the rice was in the dealer's shop could purchase their month's ration (from the Public Distribution System, the PDS). The rice stocks usually lasted only for about 2 or 3 days. Therefore, if households did not have the cash at the time the rice arrived at the dealer's shop, they would not be able to buy that month's ration and would have to buy rice from the market at a higher cost. The sangham women asked CEC to help them solve this problem. CEC provided loans of Rs. 100 per member, to be repaid in 4 instalments over the month.

Although between 45 and 50 members were given these loans, the scheme was stopped soon after for two reasons. First, the burden of administering the loans was falling on the main member behind the women's sangham in Mirzapur, Bayamma, and her nephew, and it was proving to be too much of a burden for them. Second, members were not repaying their loans on time, perhaps because they did not take a small amount like Rs. 100 very seriously, or because they took CEC assistance for granted.

3.3.3 Fallow Land Redevelopment Programme

To try and strengthen the working and the benefits from the working of the Sangham, CEC and Sangham members decided to support the cultivation of private fallow land of Sangham members. These lands were only being cultivated in the rainfed kharif season (if at all), and were being left fallow during the rabi season because of a combination of factors, including the lack of irrigation facilities, the need for tractor ploughing to soften the land for cultivation in the absence of rainfall and irrigation, and the lack of credit to pay for the tractor.

CEC agreed with the sangham members to pay for a tractor to plough their land, payment for which was based on the amount of diesel consumed (this rate currently is Rs. 50 per litre). Although initially CEC planned to recover the cost of tractor ploughing in easy instalments of cash or grain, the crop failures of 2000 and 2001 made this difficult and CEC has now written off these loans.

In 1996, around 36 acres were tilled, which rose to around 100 acres in 1999, and 110 acres in 2000. In 2001, however, only 55 acres were tilled. However, since land once tilled is not re-tilled the following year, it is difficult to conclude whether the decline is due to no more members' land being available to till or a lack of interest among the remaining members

3.3.4 Leased Land Cultivation Programme

In 1996, CEC started to facilitate the cultivation by SHG women of land leased from other farmers. These were often also fallow lands that the owner was unable to cultivated due to cash or labour problems. In some cases the owner needed cash and therefore preferred to lease out the land to the group. In the first year, the women leased 12 acres of land on a 2-year contract, paying Rs. 19,000 as the lease amount. The terms of the lease was that the women are entitled to all the produce from the land during these two years and had to return the land to the owner thereafter. The land was of poor quality and not of not suited to sorghum cultivation and so they grew green gram on six acres in kharif, and black gram on the remaining six acres. In rabi, however, they could only cultivate nine acres of Bengal gram, coriander, safflower and wheat, since three acres were water logged following rains in December.

In 1999, the sangham women negotiated a 2-year lease with one Shankarappa for 4 acres of land paying Rs. 18,000, and a 4-year lease with Kasinath, under similar terms to the first lease, for 9 acres of land paying Rs. 28,000. Both these lands were of better quality and yielded higher returns.

In 2000, however, they negotiated a 5-year lease for 13 acres from under Soor Reddy under a different set of conditions. The terms of this lease stipulated a payment of Rs. 1,10,000 to the landowner, which would be returned to the sangham women after the period of the lease. This implied that while the women were entitled to all the produce from that land for the lease period, the landowner could enjoy the interest on the lease amount for a period of 5 years

The lease amounts for the first three loans were advanced by CEC, who also advanced the sangham women the working capital required for cultivation. The sangham repaid this loan in instalments, and were able to put up Rs. 40,000 towards the final lease, with CEC putting in the remaining Rs. 70,000.

The sangham women working on the leased land earn wages – in cash for weeding and in grain for harvesting – and also get a share in the output distributed freely by the Sangham (mostly in the case of sorghum). The money from the sale of the remaining output in the local market is used to repay CEC.

3.3.5 Sorghum Loans

As the kharif sorghum crop failure in 1997 had affected the sangham women, CEC advanced sangham members a one off loan of 50 kgs of sorghum each.

3.3.6 Food Security Committee

In 1997, a five-member Food Security Committee was formed from the women's SHG members in the village and headed by Bayamma. This committee was in charge of activities to do with food, including the fallow land programme and food security loans to members

3.3.7 Community Hall

In 1997, the Sangham members met the local MLA and lobbied him to sanction a community hall for the village women's groups (*mahila mandali*). They undertook the construction themselves with an advance payment and it is nearly complete today. However, since the term of the local MLA was over before the completion of the building, and the new MLA comes from a different party, they still have to get remaining funds.

3.3.8 Community Grain Bin

When the sangham women stored the grain produced from the leased land in bags, they lost around 20% to rodents, despite their best efforts at protection. This prompted them to initiate the issue of a community storage bin with CEC, which CEC took up in collaboration with IGMRI of Hyderabad.

Construction of the 1.3 ton capacity single-compartment community storage bin started in 1999 and was completed in 2000, in time for the kharif sorghum crop from the leased land to be stored.

The sangham also bought and stored sorghum produced on lands leased by the sangham in the neighbouring village of Malkapur, as well as that produced on the land taken up under the fallow land regeneration programme in Mirzapur. The total came to 64 quintals, about half of which was distributed in August and September of 2000, and the rest sold to CEC for distribution in the drought-hit district of Nalgonda.

(It is in this context of active engagement with Mirzapur and other villages in Medak district that CEC entered into the present project agreement with NRI and the IGMRI of Hyderabad in July 2000.)

The community grain bin was next filled (with sorghum) only in January 2001, with the output from the kharif 2000 crop. While the sorghum crop sown in February 2000 failed, that sown in July 2001 yielded blackened grain due to the unseasonal rain. But since this blackened grain was distributed to the Sangham members, the grain filled in January 2001 had few takers, and only about 33 quintals out of 54 could be sold to Sangham members by January 2002. The remaining sorghum is to be sold in the market to make way for the new rabi crop to be harvested in March 2002.

3.3.9 Milch Animal Distribution

In 2000 CEC distributed 5 milch animals to 5 sangham members and another 10 animals in 2001, in an attempt to improve the economic status of these women. The beneficiaries have to repay the cost of the animal in instalments of Rs. 500/- per month, and should complete the full repayment in a year.

3.3.10 Solar Light Distribution

In collaboration with the UNDP programme to use renewable energy through solar power, CEC has facilitated the procurement and subsidised sale of 8 solar lights to sangham members in October and November 2001. By using these lights, which can also be taken to the fields, members can save money on electricity to some extent. Beneficiaries have to repay the money in instalments of Rs. 30 per month for two years, which will go towards expenditure on maintenance and the battery.

3.3.11 Thresher Scheme

After being informed that SHG members have to pay harvested grain to others for threshing, CEC purchased a mechanical thresher for the village women's Sangham in 2001. The funds from this come from UNDP. This helps them save threshing charges and also helps them earn more grain by hiring the thresher to others. CEC appointed 3 staff members to look after these activities, collect the instalments, guide members to take the right direction and to pass on the latest information regarding the organisation.

3.3.12 Sangham Activities

All the SHG members regularly participate in the meetings held every week. Every week two members of the Sangham participate in the meetings held in Nyalkal on Mondays with the representatives of the women's sanghams of the other villages where CEC is working. In this meeting they discuss among themselves and also with CEC staff possibilities of improving or implementing other activities and paying back the instalments. They discuss complaints and problems that they face in the respective villages, and discuss possible solutions. All sangham members who come to weekly meetings at the mandal level are given refreshment and are repaid travel expenses. Apart from this they are also given Rs. 25 towards wages foregone in order to attend the meeting.

Apart from this Mirzapur (N) group leaders conduct weekly meeting with all the group members at village level and inform them about their SHG's position, economically, socially and politically with latest information from the weekly and monthly meetings held at Nyalkal and other places.

3.4 LEARNING FROM THE INTERACTION

The women of the Mirzapur Mahila Sanghams have learnt a great deal from the experience of establishing and nurturing the sangham. Two key observations made during the discussions with the women of the sangham during the recent field visit are described below.

3.4.1 Problems with giving grain on credit

The sangham feels that giving grain on credit is not desirable because the repayment is not assured. This is largely because of a few members not re-paying the earlier rice and sorghum loans. But this is an important finding in the light of one of the stated purposes of the community grain bin – to loan grain to members in times of distress, when prices are high, which can be repaid later in cash or in grain.

3.4.2 Discrimination within the sangham

From the discussions with sangham women it was evident that certain members were clearly displeased with the present style of functioning of the sangham. Basically, the complaint was that not all members were clear about the basis of certain decisions taken within the sangham. For example, those who had not received buffalo loans asked on what basis they were excluded (or, conversely, loans were given to the 'lucky few'). Those who had not received solar lamps distributed to a few sangham members asked similar questions. And also those who were not allowed to work on leased land asked why.

While it is most certainly an issue of transparency, these are issues that need further investigation to ascertain the true reasons for dissatisfaction, and the link with the policy and functioning of the sangham.

Whatever the reasons, such dissatisfaction is detrimental to the future sustainability of the sangham and needs to be tackled.

4. THE COMMUNITY STORAGE BIN IN MIRZAPUR

4.1 INTRODUCTION

With the background to the community storage bin in Mirzapur that was sketched in the previous section, this section looks at the details of the setting up and operation of the bin. While the economics and institutional structure to manage the bin are the focus of the section, it concludes with an examination of alternatives to the community storage bin, based on observations made during the review. Also, since the community storage bin is closely linked to the production of sorghum on leased land and previously fallow land of sangham members, which are the subject of the next two sections, all three have to be read in conjunction.

4.2 ECONOMICS OF COMMUNITY STORAGE

4.2.1 Construction of the Bin

The masonry grain storage bin constructed in Mirzapur in 2000 cost nearly Rs. 36,000, which at today's prices comes to about Rs. 42,500 (see Table 4.1; details are in Annexure 6).

It costs nearly Rs. 11,000 per year to operate, which includes the transport and boarding costs of CEC and IGMRI persons who supervise the quality and operation of the bin.

Table 4.1: Total Construction Costs and Annual O&M Costs of the Mirzapur Bin

(All in Rs.)

Cost Components	Original Costs (@ 2000 prices)	Current Costs (@ 2001 prices)
Materials Cost	24,104	26,809
Labour Cost	6,840	10,140
Other Construction Costs	5,050	5,500
TOTAL	35,994	42,449
Annual Operation & Maintenance Costs		10,860

4.2.2 Operation of the Bin

In terms of a pure business model, managers of a grain storage bin would try to maximise the profit of buying grain cheap and selling dear after of course paying for the operational costs of running the bin. But in both years of operation of the bin, viz., 2000 and 2001, grain was bought and sold at the same price.

In the first year, grain was purchased from the fallow land programme of Mirzapur (N), and the leased land programmes in the three villages of Mirzapur (B), Mirzapur (N) and Malkapur (see Table 4.2).

Table 4.2: Purchases of Grain for the Mirzapur (N) Grain Bin, 1999 - 2001

	Date	Seller	Quantity purchased (quintals)	Price	Amount paid
1	2000	Mirzapur N Fallow land	38.00	550	20,900
2	2000	Mirzapur N Leased land	15.00	550	8,250
3	2000	Malkapur Leased Land	4.70	550	2,585
4	2000	Mirzapur B Leased Land	12.00	550	6,600
		TOTAL in 2000	**69.70**		**38,335**
5	2001	Mirzapur N Fallow Land	54.12	400	21,648
		TOTAL in 2001	**54.12**		**21,648**

The grain in the bin was sold to sangham members at the same price paid to purchase the grain, i.e., Rs. 550 per quintal in the first year, and Rs. 400 in the second. Sales were during August and September, which is in the lean season (see section 2.2.5 above). While sangham women bought 36.90 quintals from the bin in 2000, they purchased 33.25 quintals in 2001 (see Table 4.3).

Table 4.3: Withdrawals of Grain from the Mirzapur (N) Grain Bin, 1999 - 2001

1999 – 2000				
Date	No: of Sangham Women buyers	Quantity Sold (Quintals)	Price (Rs. /quintal)	Amount (Rs.)
05-Aug-00	17	7.25	550	3,988
11-Aug-00	16	7.50	550	4,125
20-Aug-00	9	2.20	550	1,210
30-Aug-00	8	3.20	550	1,760
05-Sep-00	9	4.90	550	2,695
10-Sep-00	25	7.25	550	3,988
25-Sep-00	11	4.60	550	2,530
TOTAL		36.90		20,295
2000 – 2001				
Date	No: of Sangham Women buyers	Quantity Sold (Quintals)	Price (Rs. /quintal)	Amount (Rs.)
05-Aug-01	17	8.50	4.00	3,400
10-Aug-01	25	10.75	4.00	4,300
02-Sep-01	26	14.00	4.00	5,600
TOTAL		33.25		13,300

In both years, however, not all the grain stored in the bin could be sold to villagers. In the first year, fortunately, the surplus grain was bought by CEC (to distribute in the drought hit villages in Nalgonda district) at the same price of Rs. 550 per quintal.

The remainder of the next year's grain (which is currently in the bin) will, however, have to be sold on the open market, where prices have fallen to a low of around Rs. 280 per quintal. Bayamma is hoping to get a maximum of Rs. 300 per quintal for the 20 odd quintals left in the bin.

The summary costs and revenues from two years of operating the bin in Mirzapur are given in Table 4.4 below.

Table 4.4: Revenue and Costs from Mirzapur Grain Bin, 1999 - 2001

Year	Quantity Bought (Quintals)	Price Paid (Rs. /qtl)	Total Cost (Rs.)	Quantity Sold (Quintals)	Price Paid (Rs. /qtl)	Total Revenue (Rs.)	Balance Quantity (Quintals)	(Expected) Price (Rs. /qtl)	Final Revenue (Rs.)	(Expected) Profit (Rs.)
1999 – 2000	69.70	550	38,335	36.90	550	20,295	32.80	550	38,335	0
2000 – 2001	54.12	400	21,648	33.25	400	13,300	20.87	300	19,561	-2,087

Thus, profits from the operation of the grain bin are zero in the first year, without taking into account the interest on capital or the costs of operation and maintenance. With either of these, the grain bin operations would register a loss. In the second year, even without taking these two economic costs into consideration, there is a minimum expected loss of around Rs. 2,000.

However, the point is whether or not the bin has to be run on a 'business model'. For, one of the purposes of establishing the bin was to sell grain on credit to poorer villagers during the lean season, when open market grain prices are high. But, according to sangham members, the actual process of distribution has not been quite so beneficial.

4.3 MANAGEMENT OF THE BIN[22]

4.3.1 General Issues

The community grain storage bin is officially managed and operated by a 5-member Food Security Committee. Bayamma, a founder member of the women's sangham in Mirzapur, however, takes most of the decisions concerning the bin. The major decisions taken in connection with the construction include choosing the location of the bin and the size of the bin. Bayamma and the other women discussed the options with CEC and IGMRI and finally decided on 1.3 tons as the size of the bin. They also decided to have a reinforced cement concrete (RCC) bin, rather than a metal bin.

4.3.2 Problems with Bin Construction

The members interviewed during the review were generally happy with the location and size of the bin. In their words, "it is better to have a big one than an insufficient one". But they are unhappy about certain other features of the bin.

- **The lack of a partition**: They now feel that it would have been better to have a partition in the middle to hold kharif and rabi grain separately.

- **The heaviness of the lid**: They also find the RCC lid too heavy and it is difficult for women to climb on top of the bin and open it. Several women have hurt their fingers and hands trying to open it. Instead, they now feel it would be better to have a fibreglass or metal lid.[23]

[22] It is difficult to separate conceptually management issues from economic ones. The distinction followed here, therefore, is only for convenience, and the economic dimensions of some management problems (e.g., costs of repair) are addressed in this section.

[23] According to IGMRI, the original design for the lid was metal. But in Mirzapur (N) they found it difficult to find a blacksmith who could replicate the design, because of the complexity of the locking system - hence the decision to make a cement lid. But the lid became too heavy for even three women to open and they also got hurt on occasion. A Delhi-based consultant suggested a design using Fibre Reinforced Plastic (FRP), which was

- **Pest Infestation due to Moisture**: Moisture in the bin is one factor responsible for pest infestation in the bin, seeping in from the outlet. The present outlet was not fitted properly and the cement plastering was also not up to the mark, because of which small quantities of rainwater settles near the outlet causing dampness, which is favourable for pest growth. The sangham women now feel a stone structure with a light and smooth finish in cement is ideal. Such a bin would be better than the RCC bin but metal would not, since rust could be a problem.

These problems were discussed with Mr. Jayaraj of IGMRI who acknowledged that these problems were not anticipated at the outset. He felt that it is now not possible to build a partition in the bin, not only because a partition introduced into a finished structure could weaken it, and also because there is not enough place to build two lids. But he feels that it should be possible to install a fibreglass lid and to seal the inlet and outlet to reduce the problem of moisture in the bin. In addition, he suggested painting the lid with gas proof paints to make it as airtight as possible. The estimated costs of doing these repairs are detailed in Table 4.5.

Table 4.5: Estimated Costs of Repairing the Mirzapur Bin

Item	Details	Cost of Materials (Rs.)	Number of Days	Rate per day (Rs.)	Cost (Rs.)	Sub-Totals (Rs.)
Outlet	Mason		1	200.00	200	230
	Woman		1	30.00	30	
	Sub-total				230	
Inlet lid	Moulded fibre glass lid	600.00			600	1,240
	Mason		2	200.00	400	
	Male labour		2	50.00	100	
	Cement (1 bag)	140.00			140	
	Sub-total				1,240	
	Details	Number of Units	Unit	Rate (Rs.)	Cost (Rs.)	Sub-Total (Rs.)
Air tight sealing	Inlet; 'putty' (once in 3 months)	2	Kgs	20.00	160	1,660
	Outlet; sealing with paper or polythene				0	
	Gas proof paints	5	Litres	300.00	1,500	
	Painter (400 sq.ft. @ Rs. 3 per sq.ft.)	400	Days	3.00	1,200	
	Sub-total				1,660	
TOTAL						3,130

All these could be done once the grain in the bin is taken out, and before the bin is re-filled with rabi sorghum.

Apart from moisture entering the bin, there were also two specific problems with the grain in the bin, both of which could contribute to pest infestation:

- **Foreign matter**: A recent sample study showed that the grain stored in the bin contained more foreign matter compared to grain stored in individual homes, which could lead to higher pest infestation inside the bin.

- **Insufficient drying**: The IGMRI feels that single layer grain drying is essential to avoid pest attacks. The grain that needs to be cleaned and dried before storing is not put through such vigorous process (largely because of space constraints) and that becomes a reason for pest attacks.

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made to order and imported from Delhi. But this lid was not given to Mirzapur (N) at the time - it is being used for the recently constructed bin in Kollur village

But the requirement of a 6' x 4' plot (24 sq. ft) to drain one quintal of grain in a single layer, means that single layer drying of 40 bags at a time is near to impossible. One possibility is of members cleaning and drying small quantities of grain in their own homes, but the sangham is not sure if this will work.

Apart from such 'sun drying', solar drying is another possibility but, like sun drying, it may not work if there is rain during the drying period. If it rains, mould develops on the grain, and no technology can then help. Yellow sorghum is the only variety that does not develop mould but people prefer the white sorghum variety since the yield is better.

4.3.3 Purchase and Sale of Grain

Bayamma and the Food Security Committee of Mirzapur decide, after discussions with CEC staff, on the quantity and price of grain purchased for the bin, and the quantity and price of the grain sold from the bin. While there were no problems reported with the purchase of grain for storage in the bin, several issues were raised concerning the sale of grain.

Restrictions on Sales: Members' Views

Sangham members interviewed mentioned that grain from the bin is sold to members only when Bayamma (on behalf of the Food Security Committee (FSC)) decided to sell it. But sale is strictly on the basis of cash since Bayamma and the FSC does not like giving grain on credit. Also, these members reported that the FSC (or Bayamma) does not allow let them buy small quantities (1-2 kgs) from the bin (presumably because of the problems of opening the bin and taking grain out). This forces them to buy grain from the open market, at higher prices – even when cheaper grain is available in the bin.

Finally, non-members pointed out that sorghum from the bin is not usually available to non-sangham members (but see below).

Difficulties in Sales: Committee's Views

According to Bayamma and the others in the Food Security Committee (FSC), there are currently no takers among the sangham members for the grain in the bin village market since sorghum prices in the open market are low and most members have sufficient left over grain in their houses. In fact, there is now pressure to sell the grain stored in the bin since it must be emptied to store the rabi crop that is due to come in February/March. Bayamma is looking to sell the grain currently in the bin on the open market at whatever price she can get for it, so that the bin can be emptied and cleaned before the rabi harvest. She however agreed to the suggestion of the review team that the remaining grain be first offered to sangham members before it is sold in the open market. She also agreed to offer this grain to non-sangham members, although this was not previously considered as an option by the FSC.

The impacts of these decisions are felt on two major stakeholder groups in the village, those who buy sorghum from the bin and those who sell sorghum to the bin. These impacts are examined in greater detail below.

4.4 BENEFITS OF THE COMMUNITY BIN TO STAKEHOLDERS.

4.4.1 Sorghum Purchasers

As far as purchasers are concerned, even if the market price of purchased sorghum was exactly the same as that of the grain in the bin, there would be savings of transportation (around Rs. 20) and wages (about Rs. 30, which would have been forgone if a trip to the market had to be undertaken).

Since villagers normally buy a maximum of 1 quintal per trip, this represents a saving of Rs. 50 per quintal (or 50 paise per kilogram).

For the first year, the purchase price was Rs. 550 per quintal, and the purchases took place in August and September 2000 (see Table 4.3 above). Given the savings per quintal of grain purchased from the bin, it is safe to conclude that even if the price of sorghum in the market were Rs. 500 per quintal, purchasers would have benefited from buying from the bin.

According to the data in Table 4.5 above, hybrid sorghum prices ranged between Rs. 450 and Rs. 800 per quintal in the period October 1999 to September 2000, while prices of kharif yellow sorghum ranged from Rs. 650 to Rs. 700 per quintal over the same period. However, in the absence of monthly sorghum prices for the year 2000, it is difficult to tell whether market prices were higher or lower than that from the bin on those specific days in August and September 2000, for the same quality of grain.

In the second year, grain was purchased from sellers at Rs. 400 per quintal in January 2001, and sold to sangham members in August and September 2001 for the same price. But all the stored grain has not been sold and there are currently about 20 quintals. The fact that there are no takers currently for the sorghum in the bin at the price of Rs. 400 per quintal only underscores the fact that purchasers would face a loss if they bought grain from the bin: they either have enough for the moment, can buy cheaper on the market, or prefer rice to sorghum.

The point to note is that it is difficult to conclude definitively that the bin has provided the anticipated benefit of selling (or lending) grain at lower-than-market rates to poorer households in the village during the lean season. While the sales have indeed been during the lean season (August – October) when household grain stocks are running low and before the kharif crop has come in, the price differential is difficult to establish without more accurate data.

4.4.2 **Sorghum Sellers**

Those who sold sorghum to the bin in both years have clearly benefited. The sellers include the sangham members in Mirzapur (N) who produced sorghum on their fallow lands, and the sangham members in Mirzapur (N), Mirzapur (B) and Malkapur who produced sorghum on land leased from other landowners in the village. According to the Sangham members, the price offered for the grain was the same as the market price. However, selling to the Sangham would save the sellers the transportation costs, the commission the *hamali* (cartage) charges, etc., all of which amount to about Rs. 25 per quintal.

Indeed this is to be expected when grain is to be sourced from other sources (e.g., sanghams in other villages like Malkapuram and Mirzapur (B) as well as those producing sorghum on own fallow lands in Mirzapur (N), who would need an inducement to sell their grain to the Mirzapur (N) bin rather than to the market.

However, recent trends in the market price of sorghum have affected the operations of the bin. But they could well be improving the food security of poorer households in these villages in the region.

4.5 **SORGHUM MARKET PRICES**

The behaviour of market prices of sorghum seems to have changed in the recent past, with most sorghum prices low and falling over the last year or so (see Table 4.6). In January 2002, both Kharif yellow sorghum and hybrid sorghum were selling for Rs. 350 a quintal, while the mouldy (blackened) sorghum from last year's unseasonal rain-affected kharif could be purchased for only Rs. 250 per quintal. Only rabi sorghum, the variety most preferred for eating, was selling for its normal price of Rs. 700 to Rs. 850 per quintal.

Table 4.6: Sorghum Prices in Zaheerabad Market, October 1998 - January 2002

All prices Rs. Per quintal

Crop	October 1998 to September 1999*	October 1999 to September 2000*	October 2000 to February 2001*	March 2001 to May 2001	June 2001 to November 2001	December 2001 to January 2002
Local Supply						
Kharif Yellow Sorghum	-	700 (650)	-	450	400	350
Hybrid Sorghum	800 (450)	650 (500)	450 (400)	---	400	350
Improved Sorghum				400	450	450
Mouldy Sorghum				---	---	250
Rabi White Sorghum	1100 (900)	1000 (900)	550 (475)	700	750	850
From Proddutur, Cuddappah						
Hybrid Sorghum				400	350	300
Kharif Yellow Sorghum				450	500	780
Improved Sorghum				---	---	650
From Raichur, Karnataka						
Rabi White Sorghum				600	550	650

* The maximum price per quintal over the entire period is given first and the minimum price is given in brackets.

The available data show a decline in the price of kharif yellow sorghum and hybrid sorghum over the period October 1998 to January 2002, while the price of rabi white sorghum has a sharp dip in the middle of a generally declining trend. However, these figures could be misleading, for at least two reasons: first, such large periods could hide significant variations within the periods; and second, trends will vary according to whether the maximum, minimum, or average (mean, medium or modal) price is taken. With that caveat, it appears generally true that prices have been falling over the last few years. Also, grain merchants in Zaheerabad have confirmed to CEC staff that January 2002 has seen some of the lowest prices in recent years

Both demand and supply conditions appear to have changed in the local market. While supply used to be local and twice a year (kharif around December and Rabi around March), there are now substantial inflows from surrounding markets. Sorghum from Proddutur in Cuddapah district in southern Andhra Pradesh, from Raichur in Karnataka and from Maharashtra in the last few years resulted in a greater variety of grain and increased availability even during the 'off' season (when local grain was not available). Indeed, sorghum was being supplied around 5 times a year - early Kharif in November/December, normal kharif in December/January, early rabi in March/April, and late rabi in April/May. Although the supply from Maharashtra has stopped recently, largely due to a fall in prices, the grain merchants in Zaheerabad are still finding it difficult to sell sorghum – or even raise the price.

Nevertheless, according to these grain merchants, the reason for the drop in price is not the increase in supply. They blame it, instead, on the fall in domestic demand. Indeed, the region seems to be flush with both sorghum (from last year's production and wages in kind from kharif cultivation) and rice (from the PDS, the rice credit line, and the food for work campaign). Coupled with the availability of mouldy kharif sorghum, which the poor do not mind consuming, the increased domestic availability of food grain has meant that the villagers are not buying as much and shopkeepers cannot raise prices.

The hidden benefit of falling prices is that the real value (or purchasing power) of the money wages earned by villagers rises. They now have a choice of either buying more grain by spending the same amount of money as before, or buying the same amount a before by spending less than previously. Both confer benefits that indirectly improve the food security status of these villagers.

4.6 ALTERNATIVES TO THE COMMUNITY STORAGE BIN

Two possible alternatives to having a community storage bin are (1) individual storage bins and (2) a community storage structure where individual bags of grain can be stored.

4.6.1 Individual Storage Bins

Currently almost all households in Mirzapur store grain, both sorghum and rice, for consumption and for seed. Storage is invariably in gunny bags stacked up in a convenient space inside the house. Grain from own fields is dried before putting into bags, and grain meant for seed is first treated (e.g., with neem leaves) before bagging, in order to prevent pest infestation. Grain meant for food is however not treated so because it affects the taste of the grain (turns it bitter).

One need expressed by villagers was for metal bins of 1quintal capacity, with partitions to store different types of grain. But another problem that was mentioned was the loss of grain stored in bags to rodent attacks, especially by large rodents, like bandicoots, which are not affected by chemicals that are usually effective on smaller rodents like mice. Losses are about 5 kilograms per bag of 1 quintal over the period of storage.

There are four alternatives to household bag storage, which can prevent losses to large rodent attacks.

The first is the traditional earthen structures protect seed grain from rodents (see Annexure 2) and can store between 1 to 2 quintals of grain. Local potters can make these structures, which are low-cost, although they tend to be fragile.

The second is a metal bin to store 1.25 quintals, being promoted and distributed by the Save Grain Campaign of the Ministry of Food and Civil Supplies, Government of India, which is detailed below.
The third is a low-cost plastic bin (as available in the market to store water or garbage). IGMRI discussed this option with the NRI grain storage specialist and it was agreed that locally available plastic containers might be suitable for grain storage, provided the lid can be sealed properly.

The fourth is a community storage structure to store individual bags of grain on a large scale, which is also discussed in more detail below.

Save Grain Campaign

This is an extension programme carried out by IGMRI for the Ministry of Food and Civil Supplies, Government of India, training farmers in the safe storage of food grain. Under this programme, interested villagers have to write to IGMRI who will then conduct a 10-day training programme, consisting of 5 days of instruction on problems in storage, prevention of storage losses, demonstration of fumigation techniques, the use of rat poisons in houses, etc. This awareness generation phase is followed by 5 days of practical 'hands-on' training on carrying out fumigation (using ethylene dibromide) in groups, mass rodent control on village basis (consisting of identifying active rodent burrows and putting 1-2 tablets of aluminium phosphate in them and covering them with moist mud, and letting the resultant phosphene gas eliminate the rodents), etc.

In addition to providing training, the campaign also subsidizes the costs of individual metal storage bins capable of storing 1.25 quintal of grain for the trainees. Each bin costs Rs. 425, but each trainee gets a subsidy of 25% (around Rs. 106) and is also encouraged to donate the training stipend of Rs. 250 (@ Rs. 25 per day) towards the bin, leaving an out-of-pocket cost of only Rs. 60.

Once the villagers, on CEC on their behalf, write to IGMRI requesting training under the Save Grain Campaign, IGMRI is prepared to conduct the training in Mirzapur.

But the critical point to note is that the relatively small size of the bin (1.25 quintals) would mean that it can only be used to store seed grain and not the larger quantities of food grain. Of course purchasing several such bins could perhaps be a solution. Plastic bins could store larger quantities of grain and are available at lower costs

4.6.2 Community Storage Structure

During field discussions, one suggestion that emerged was for a community storage structure constructed so that individual bags of grain could be stored. Villagers in Thogapur had raised this issue during discussions about the nature of community storage in their village. Such an arrangement would give an incentive to all sorghum producers in the village to store their grain in the community storage structure – rather than just the sangham members who produced sorghum either on leased land or on their own fallow lands. Just as in a conventional bank, this type of storage would allow villagers to bring their own bags to the structure and 'withdraw' grain from their own bags as needed. However, this would entail a different type of storage facility, more like a room where individual bags are stored (say on shelves), labelled with the name of the owner. For, if all the grain were to be poured into a single bin, differences in grain type and quality could affect the quality of the grain stored. Explaining this issue, Jagannatha Rao of CEC said that improper drying of the grain could increase storage losses due to moisture.

The larger issue of course is the incentive to individual members to use such a storage structure. Since the current practice is for each household to dry and store grain in bags in their own houses, the only benefit of using a community storage structure would be to avoid losses due to large rodents (e.g., bandicoots) – for which there was no satisfactory solution in the case of household storage in bags. However, since the losses due to these are only about 5 kgs in a quintal of sorghum, the financial benefit would only be around Rs. 25 (at the rate of Rs. 500 per quintal or Rs. 5 per kg). This implies that the community storage would have to operate with a budget of around Rs. 25 per quintal bag. The latest available statistics for Mirzapur states that around 170 acres of yellow sorghum and about 70 acres of white sorghum are produced in kharif, while only 14 acres of white sorghum are produced in rabi. Assuming a yield of 4 quintals per acre, about 680 quintals or 68 tons of yellow sorghum and about 280 quintals or 28 tons of white sorghum are produced in kharif, and about 56quintals or 5.6 tons of white sorghum in rabi.

If even half of the sorghum produced in the village were stored in the community storage structure, this would mean around 48 tons in kharif and 2.8 tons in rabi. Assuming that villagers would be interested in storing this grain for 3 months (to sell when prices rise), the losses they would avoid from rodents would be around Rs. 6,800 of yellow sorghum in kharif (assuming a price of Rs. 400 per quintal), Rs. 5,600 for white sorghum in kharif (assuming a price of Rs. 800 per quintal), and Rs. 1,120 for white sorghum in rabi (again assuming a price of Rs. 800 per quintal) (see Table 4.6 below).

Table 4.7: Potential Savings from Community Storage Structure

Type of sorghum	Area cultivated in 1999 – 2000* (acres)	Assumed yield per acre (Quintals)	Quantity Produced (Quintals)	Losses to Rodents** (Quintals)	Value of Losses*** (Rs.)	Potential Benefits**** (Rs.)
Kharif yellow sorghum	170	4	680	34	13,600	6,800
Kharif white sorghum	70	4	280	14	11,200	5,600
Rabi white sorghum	14	4	56	2.8	2,240	1,120
TOTAL						13,520

* From the village statistics available at the Nyalkal Mandal office.
** At the rate of 5 kgs per quintal
*** Assuming a price of Rs. 400 per quintal of yellow sorghum and Rs. 800 per quintal of white sorghum
**** Assuming that 50% of the production would be stored in the community storage structure.

A total of Rs. 13,520 would then be available to run the community storage structure, assuming that the construction is paid for. This works out to around Rs. 1,125 per month for a whole year, or Rs. 2,250 per month for six months of operation. If the operating costs are Rs. 1,000 per month, this is a saving of around Rs. 7,500 per year of operation. Thus, if the structure costs Rs. 1,50,000 to build, about 50% of this cost could be paid by the profits of 10 years of operation (excluding the cost of credit).

While such a storage structure could perform the functions of a bank of grain in a modern-day banking sense, and while it may also be economically feasible to manage and operate such a structure, the incentive to participate in such a venture could be affected by the availability of (cheap) individual storage structures – either of the traditional earthen variety or the modern metal variety.

4.7 LINK WITH LAND LEASE PROGRAMME

The operation of the community storage bin in Mirzapur is strongly linked to the land lease programme. The sangham women were clear that while they would dry and store grain from their own lands in their own houses, the grain from the community enterprise on leased land would be stored in the bin. In other words, they stated that in the absence of a leased land programme, they had no use for a community bin. When asked if they would recommend a community bin for another village, they said they would only if there was some community production. A more detailed examination of the leased land programme revealed that there was a distinct shift in the cropping pattern towards market production rather than sorghum production for own use.

5. LEASED LAND CULTIVATION PROGRAMME

5.1 INTRODUCTION

The leased land cultivation programme started in 1996-97, but it is the last three leases over the period 1999 – 2000 that are of direct concern since they provided some of the input into the community storage bin in Mirzapur. This section details of these leases in terms of the area, period and lease amounts as well as the area under different crops grown on these lands. It also describes the benefits of free grain distributed to sangham members, wages paid to those sangham members who worked on the land and the cash income from sold output that was used by the sangham to repay CEC for loans provided to lease these lands and also to purchase working capital for cultivation.

5.2 DETAILS OF LEASE LAND PRODUTION

5.2.1 The Leases

The details of the last three leases taken up by the members of the women's self-help groups (SHGs), or mahila sanghams, in Mirzapur are given in Table 5.1.

Table 5.1: Details of the Leased Land Cultivation in Mirzapur, 1999 - 2001

	Start of Lease	End of Lease	Area leased	Lease value	Leased from
First lease	April 1999	March 2001	4 acres	18,000	Sankarappa
Second lease	April 1999	March 2003	9 acres	28,000	Kashinath
Third lease	April 2000	March 2005	13 acres	110,000	Soor Reddy

The season-wise area leased from landowners under the leased land programme for the last three leases, i.e., excluding the lease signed in 1996, is given in Table 5.2.

Table 5.2: Area leased in Kharif and Rabi, 1999 – 2001, in Mirzapur

	Area leased in Kharif (acres)	Area leased in Rabi (acres)
1999	13	13
2000	23	26
2001	22	22
TOTAL	58	61

5.2.2 Crops Grown on Leased Land

The details of the area under different crops produced on these leased lands are given in Table 5.3. The largest kharif area is under green gram and sorghum, which together account for 51 out of the 58 acres cultivated so far. Pigeonpea was also grown on 17 acres in kharif, where it was grown intercropped either with sorghum (6 acres) or black gram (1 acre). In rabi, however, most of the area has been under chickpea (23 out of 61 acres), with the area under kharif-sown pigeonpea accounting or 17 acres, and rabi sorghum for only 9 acres.

Table 5.3: Acreage Under Different Crops on Leased Land in Mirzapur, 1999 – 2001

All amounts in acres

Year	Kharif						Rabi						
	Green Gram	Paddy	Sorghum	Red Gram*	Black Gram	Total	Chickpea	Dhania	Safflower	Red Gram*	Sorghum	Fallow	Total
1999	7	2	4		0	13	6	3	0	4	0	0	13
	54%	15%	31%		0%	100%	46%	23%		31%			100%
2000	13	0	9		1	23	10	2	0	8	4	2	26
	57%		39%		4%	100%	38%	7%		31%	15%	7%	100%
2001	15	0	3		4	22	7	1	4	5	5	0	22
	68%		14%		18%	100%	32%	4%	18%	23%	23%		100%
Total	35	2	16	0*	5	58	23	6	4	17	9	2	61
	60%	3%	28%		9%	100%	38%	10%	6%	28%	15%	3%	100%

* Pigeon pea intercropped with kharif sorghum and harvested in rabi occupies independent area only in rabi.

These data bring out an interesting aspect of the leased land cultivation. Traditionally, pulse crops like green gram and black gram were sown in kharif to prepare the land for a subsequent sorghum crop in rabi. However, although 40 acres have been sown under kharif pulses only 9 acres were planted with rabi sorghum. According to the sangham women, this reflects both the past losses of the rabi sorghum crop (due to poor rains) and a preference for cash crops like chickpea, dhania and safflower.

5.3 BENEFITS FROM LEASED LAND CULTIVATION

Three types of benefits are generated from leased land cultivation: grain for free distribution among sangham members, wages for sangham members, and cash income from grain sale. Each of these is detailed below for the period 1999 – 2001 in Mirzapur. It is important to note that all sangham women do not work on leased land. Of the 60 odd members of the sangham, only around 20 women appear to have worked on the leased land. It is these women who earn wages in kind or cash, while the entire set of sangham women benefit from free distribution and the sangham as a group benefits from earning cash income, which is used to repay CEC or to build up the corpus of funds for the future.

5.3.1 Free Distribution of Grain

The grain output distributed among sangham members is detailed in Table 5.4. Only 12 quintals of grain from the kharif sorghum production in 1999 was put into the community bin from leased land production. The rest of the sorghum production in other years, as well as the output from other pulse crops and paddy was distributed free to each Sangham members as benefits of leased land production.

Table 5.4: Leased Land Output Distributed to Sangham Members, Mirzapur, 1999 – 2001

All amounts in quintals

Year	Season	Kharif Sorghum	Rabi Sorghum	Pigeonpea	Green gram	Chickpea	Paddy	Black gram
1999	Kharif	**12.00***					8.00	
1999	Rabi					1.00		
2000	Kharif	30.75						
2000	Rabi		4.50	0.50		3.75		
2001	Kharif	15.00			4.00			
TOTALS		57.75	4.50	0.50	4.00	4.75	8.00	0.00

* Put into the community grain bin

Clearly the major grain distributed has been sorghum, followed by paddy, green gram and chickpea. As mentioned earlier, not all the sangham women work as agricultural labour on the leased lands, and this smaller group of women has an additional benefit of wages in either cash or kind.

5.3.2 Wages from Leased Land Cultivation

In Mirzapur in general, women are paid in cash for weeding and in kind for harvesting. Cash wages for women are Rs. 20 per day, while wages in kind are 5 kgs (or 4 seers where 1 seer = 1.25 kgs) of grain per day. Wages have the first claim on harvested output, followed by the bullock man's share of one quarter of output. Only the remaining output is taken to the market and sold. Table 5.5 details the wages paid in kind from leased land production.

Table 5.5: Wages in Kind Paid to Sangham Workers on Leased Land, Mirzapur, 1999 - 2001

All amounts in quintals

Year	Season	Kharif Sorghum	Rabi Sorghum	Pigeonpea		Chickpea	Paddy	Black gram
1999	Kharif							
1999	Rabi							
2000	Kharif				13.90			
2000	Rabi		1.00			0.32		
2001	Kharif				1.20			
TOTALS			1.00		15.10	0.32		

This table shows that although sangham women worked on a variety of crops, green gram cultivation has been the main source of wages. The low wages from working on the most productive crop – sorghum – is striking, but perhaps understandable given the priority placed on free distribution: Bayamma and the other sangham women explained that a smaller number of women giving up wages for work on sorghum means more is available for distribution to the larger set of all sangham women.

While cash wages were also paid to sangham women in a few cases, details were difficult to obtain. According to Bayamma and other sangham women, workers gave up cash wages either because they wanted to generate greater cash revenue for the sangham's fund or because the crop failed.

5.3.3 Cash Income From Leased Land Production

The cash income from leased land production is mostly used to repay CEC for the working capital for the leased land production or put into the general corpus fund used to repay the loans taken from CEC (e.g., to pay the lease amount). The total cash income for these three years is given in Table 5.6.

Table 5.6: Cash Income from Leased Land Cultivation, Mirzapur, 1999 - 2001

Year		Crop	Date of Sale	Qty sold (Quintals)	Sale Price			
						Per Sale	per Season	% Share
1999	Kharif	Green gram	07-Oct-99	1.01	1627	1,643	1,643	6%
1999	Rabi	Dhania	27-Dec-99	0.70	1130	791	79	
		Linseed	25-Jan-00	0.41	1400	574		
		Chickpea	25-Jan-00	5.29	1263	6,681		
		Pigeonpea	25-Jan-00	2.06	1439	2,964		
		Chickpea	16-Mar-00	3.11	1401	4,357	15,368	53%
2000	Kharif					0	0	0%
2000	Rabi	Chickpea	10-Apr-01	2.94	1729	5,083		
		Chickpea	10-Apr-01	0.88	1711	1,506		
		Pigeonpea	10-Apr-01	0.60	1200	720	7,309	25%
2001	Kharif	Green gram	19-Sep-01	2.49	1829	4,554	4,554	16%
TOTALS						28,874		100%

Table 5.6 shows that out of the total of Rs. 28,874 received as cash from sale of output produced on leased land, more than half came from the sale in early 2000 (53%), followed by sale in early 2001 (25%). In other words, the kharif sale has been low (around 22%) compared to rabi, indicating the extreme dependence of these crops on rainfall.

5.4 WIDER BENEFITS FROM THE LEASED LAND EXPERIENCE

The members of the sangham by and large feel that the experience with leased land cultivation is beneficial. They cite the following benefits, which have been divided into community benefits (which benefit the village community as a whole), sangham benefits (which benefit the sangham as an whole entity), sangham members' benefits (which benefit all members), and sangham workers' benefits (which benefit only those working on leased land).

5.4.1 Community Benefits

- ***Increased acreage and production***: The leasing in of land previously left fallow by landowners has increased acreage under cultivation in the village as well as agricultural production.

- ***Distribution to Destitutes***: The sangham distributed sorghum free to four destitute families in the village, from the production on the leased land.

5.4.2 Sangham Benefits

- ***Improved bargaining position in the village***: Compared to even the initial years of the leased land programme, sangham women feel that they are now in a better position to negotiate with landowners in the village. While there was scepticism initially and they could only lease inferior quality land during the first years, farmers are now offering their land to the sangham. While this could reflect farmers ' desire to get some return on land they cannot profitably cultivate given the shortage of agricultural labour in the village, it certainly indicates that these landowners now feel that leasing such land to sangham women is a viable financial proposition.

- ***Earnings for sangham corpus fund***: The sale of output from leased land production helped repay CEC for the loan advanced for working capital as well as the leased amount (see Table 5.6 above for details).

5.4.3 Sangham Members' Benefits

- ***Availability of and access to grain in the village***: The community bin has provided sangham women with sorghum they can buy readily in the village, instead of buying from the market. This, however, is not generally true for at least three reasons: (1) grain sales have been only in 2 months (August and September) in each of the past two years; (2) sangham women have been buying sorghum from the open market despite there being sorghum in the bin, because they wanted small quantities that the FSC was reluctant to sell; and (3) the FSC was reluctant to sell sorghum to sangham members on credit (reinforcing the problem of entitlement and access that Sen has written about; see section 2.2.8, p. 11)

- ***Feeling of security with grain stored in the grain bank***: For those who had the cash at hand to buy grain when needed, the bin has provided a sense of security. It is not clear from the short field visit, however, how many sangham members cannot afford to buy grain from the bin. The impression is that agricultural labourers are the ones with the cash to purchase grain from the bin.

- ***Free distribution of grain***: Although the quantities of grain distributed free has decreased in recent years, this has been mentioned as a benefit from leased land cultivation (see Table 5.4 for details).

5.4.4 Sangham Workers' Benefits

- **Development of a Collective Work Culture**: According to sangham women working on leased lands, they have learnt to work together as a group, which has improved their efficiency.

- **Increased employment**: An important contribution of the leased land programme is an increase in the number of workdays available to sangham women. However, the benefit is not evenly distributed among the members of the sangham since only a small group within the sangham works on the leased land programme.

- **Pulses paid as wages**: Sangham women who worked on lease land regarded wages paid in kind as a distinct benefit. As seen earlier (Table 5.5 above), a major portion of the wages paid in kind has been green gram and black gram.

5.5 ISSUES CONCERNING LEASED LAND PRODUCTION

There are two major issues surrounding leased land production, which may be useful to discuss given the close relationship that leased land production has with the community storage bin.

5.5.1 Crop Failures

Production on rainfed leased land depends entirely on the nature of rainfall that year. The semi-arid conditions of the region ensure that leased land will not produce an output every season. Since continuous production confers the maximum benefits from leased land cultivation, this means that the sangham will almost never be able to reap the maximum benefits from leased land. Worse, if they insist on cultivating each season, they will invariably run up losses on account of working capital invested each season. For sangham women workers, however, these losses may be higher than if they worked on other farmers ' fields since they forgo wages when crops fail on leased land.[24]

The net result is that it could take a long period (perhaps 3-4 years) to break even on each lease, given the frequent crop failures that beset agricultural production in such semi-arid regions.

5.5.2 Crops for Sale versus Consumption

One question faced by sangham women working on leased land is crop choice. The pattern adopted so far seems to indicate that they cultivate the major crops being grown in the region, but the allocation of acres within the total area leased shows their preference for production for market sale versus consumption (see Table 5.3 above for the details). But in order to do so, it is necessary to first compare the costs and revenues from each of these crops.

Costs and Revenues Threshing charges, wages for human and bullock labour, and seed grain are first deducted from the total output harvested. The remainder is sold at the prevailing market price, and the

[24] It is not clear whether there is excess demand for labour in Mirzapur. On the one hand, farmers say that they have problems in getting agricultural labour; on the other it appears as if they are coping with the shortage either by increasing the input of family labour or by reducing the area cropped. On balance, therefore, it is not clear whether sangham women would be able to get alternative labour freely and on short notice. While a group of sangham women might, however, be able to negotiate work with local farmers, it is not definite if this would be the case for individual sangham members

women get this revenue less the 2% commission charged by the marketing agents. Out of this, the working capital advanced by CEC for seed, fertilisers and pesticides is deducted to arrive at profit per acre. These costs have been estimated for a typical one-acre plot and full details are in Annexure 9. Table 5.7 gives a summary of these costs.

Table 5.7: Costs, Revenues and Profits of Crops Cultivated in Mirzapur

All costs and revenues per acre

	Units	Kharif		Rabi	
		Green Gram	Sorghum+ Pigeonpea*	Chickpea	Sorghum
Area cultivated on leased land (1999 – 2001)	**Acres**	**35**	**16**	**23**	**9**
Percentage of total area cultivated in those seasons	**Percentage**	**60%**	**28%**	**39%**	**15%**
Output produced	Kilograms	200	400	150	200
Costs paid in grain	Kilograms	93	212	80	104
Output sold	Kilograms	106	187	69	95
Price per kg	Rupees	15	4	16	7
Total Revenue	**Rupees**	**1,570**	**1,709**	**1,088**	**953**
Total Cash Paid Cost (excluding costs paid in grain)	Rupees	525	1,470	700	450
Profit (Total Revenue – Total Cash Paid Cost)	**Rupees**	**1,045**	**239**	**388**	**503**

* Since sorghum is intercropped with pigeonpea, the by-product includes pigeonpea and straw (see Annexure 9 for details).

** Economic cost calculations include interest on working capital at 12% per annum for 3 months.

The preference for green gram over sorghum in kharif, despite the almost constant failure of green gram in the three years of the lease period, suggests that the group would like cash income (since cash returns from green gram are nearly twice as high).

The preference for chickpea over sorghum in rabi however is curious since not only is the per-acre profit higher for rabi sorghum but also it is also preferred for its taste. This seems to suggest that Bayamma and the other sangham women prefer achieving food security through earning enough money to buy food, rather than by growing food themselves.

6. FALLOW LAND PRODUCTION

6.1 INTRODUCTION

Since part of the input into the community bin is from the fallow land programme in Mirzapur, it may be useful to briefly outline the details of this programme. Basically, CEC paid for a tractor to till the hard ground of the land of sangham members that had been left fallow for many years for want of credit to cultivate. The critical input of credit, used in this instance to pay for tractor services, which are necessary to begin cultivation on such land, has thus enabled the women to cultivate their land.

6.2 FALLOW LANDS DEVELOPMENT PROGRAMME

The table below gives an idea of the area covered under the fallows cultivated, crops and output in quintals and yield per acre.[25] These figures, however, are only for kharif cultivation, since only some coriander has so far been grown in rabi on fewer than 25% of the reclaimed fallow land. A caveat that must be mentioned, however, is that these figures only refer to the land ploughed by the tractor paid for by CEC: they do not indicate the land under cultivation under the fallow land development programme. The difference is that a member may only get her land ploughed by tractor once, and may not repeat it the next year. This is reflected in the number of beneficiaries in each year (termed 'tillers' in the Table below), and in the full list of beneficiaries listed in Annexure 8.

Table 6.1: Area cultivated and output of fallow land, Mirzapur, 1999 – 2001

Year	No: of Tillers*	Acreage		Total Area	Output (quintals)		Yield (quintals per acre)	
		Green gram	Sorghum		Green gram	Sorghum	Green gram	Sorghum
1999-2000	25	17.20	27.15	44.35	28.40	71.75	1.65	2.64
2000-2001	53	48.20	57.00	105.20	69.50	138.00	1.44	2.42
2001-2002	17	24.00	20.20	44.20	25.25	45.50	1.05	2.25

6.3 PERCEIVED BENEFITS

The major benefits of the fallow land programme perceived by sangham women are the following.

- **Assured payment enables the use of tractors to plough fallows**: This is a re-statement of the objective of the fallow lands programme and its *modus operandi*, but it is nonetheless a positive impact in itself.

[25] There is a minor discrepancy in the figures in that while the CEC records are in terms of acres and guntas (where 40 guntas = 1 acre), the Table takes these as decimals (100 decimals = 1 acre). The difference, however, is not major. For example, the total acreage in 1999 is actually 44.63 acres, whereas the Table reports this as 44.35 acres.

- **Uncultivated lands are being brought under cultivation**: For each sangham woman member, this is an average of around 2 acres; an asset brought back into productive yield through the application of credit.

- **Decrease in soil erosion**: While the soils were hard to till because of long years of non-cultivation, wind and water erosion has steadily eroded the topsoil, reducing future yields. After the start of active cultivation, members notice a decrease in erosion, largely because of the crop cover during the monsoon months.

- **Better food availability at the household level**: Given the preference of individual households to grow a mixture of crops for consumption (sorghum) and for market sale (green gram), a noticeable impact has been the increase in food availability at the household level. On average, each household got around 2 bags of sorghum – or 200 kgs – which provides for 4 months of consumption at the average rate of 50 kgs per household per month.

- **Women are able to check diesel levels at the time of ploughing**: This is the skill building that occurred when women had to pay for tractor costs out of the money given by CEC. Tractor usage is billed according to the amount of diesel consumed, with the thumb rule being a difference of 1 inch in the pre-use and post-use levels costs Rs. 50.

One indicator of the success of the programme, apart from those listed above, is that there is a growing demand from non-members of the sangham to be included in the programme. The chief attraction is the credit given for tractor ploughing, which in turn is necessitated by the non- availability of bullocks for ploughing.

However, in order to assess the real costs of producing own food, detailed costs of cultivation of the fallows are needed (including the cost of the CEC credit subsidy and the inputs of own time, own seed and farm yard manure), which currently are unavailable.

6.4 PROBLEMS

The main problem is that characterising all rainfed farming in semi-arid areas in India: failure of rains leads to crop failure. The one input that can alleviate this situation is of course life saving irrigation, which unfortunately is not available for these fallows.

7. ISSUES IN MIRZAPUR

7.1 INTRODUCTION

Three issues of concern here are, lessons learnt by CEC over the period of interaction, food security in Mirzapur, and the future steps of the present project. Each of these is dealt with in this section.

7.2 LESSONS FOR CEC

7.2.1 Social Issues

The bin constructed in Mirzapur (N) village helped the women's sangham to address some of the problems they faced in storing grain. Earlier they did not have the experience in storing large quantity of grain, and without a bin, a lot of the grain from the fallow land and land lease programmes may have been lost to pest infestation.

But perhaps beyond helping them avoid grain losses, the bin in Mirzapur gave an impetus to the activities of the sangham. The fact that an asset has been created in the village at the initiative of the women's sangham helped to enhance the status of sangham members in their village. However, during discussions even the sangha members admitted that the bin belongs to CEC and that CEC should have the responsibility to carry out any repairs or maintenance required. Similarly, the villagers look at the grain stored in the bin as a property of CEC (which in fact it is - it constitutes the re-payment of resources forwarded to the sangha by CEC for the lease land programme).

Sustaining and building on the impact on the sangham nevertheless requires effective leadership. While a very strong leader in Mirzapur (N) creates problems in terms of allowing other members of the sangham to play active role in the operation of the project, lack of leadership as in the case with Kollur village may affect sustainability adversely.

Apart from managing the activities of the sangham and its members, the leader also has to tackle the impact of sangham members' families, especially men. In Mirzapur (N) and Thogapur, male family members extended full cooperation to the efforts of the sangham members perceiving that sangham work has resulted in greater incomes and other benefits over time. In Kollur, however, there is at least one instance where family members played a negative role in the construction of the bin (see Box). This suggests that awareness about the benefits to each sangham member from collective activity needs to be created among the male members of the family too. For women's empowerment cannot be left to women alone, and the sensitisation of men is equally necessary. And how this is managed depends at least partly on the nature of leadership of the sangham.

Problems in Kollur

When the women of Kollur planned to start construction of the bin on village panchayat land, the husband of one of the sangham members obstructed the work saying that that land belonged to him and not to the panchayat. It appears that he planned to benefit himself monetarily at the cost of the women's sangham, with the support of the then village sarpanch. Although his wife (who is a member of the sangham) pleaded with him, it was of no use.

However, while the construction of bin added to the spirit of the struggling village women, its operation threw up some new issues they had to contend with. Though the sorghum stored in the bin was to be used during the lean season, it could not be withdrawn in sufficient quantities due to falling market prices.

7.2.3 Field level problems faced

The project is not progressing according to the schedule. By this time all the three bins should have been in operation but only one is in operation. While one more bin is ready for operation, the third is still being constructed. The bin for Kollur village was delayed because of changes in the types of samples bins available, the bin for Thogapur village was delayed because of organizational changes in the implementing agency. It was initially under the UNDP's South Asia Poverty Alleviation Programme (SAPAP), which was later replaced by the World Bank supported District Poverty Initiatives Project (DPIP).

Also, sangham members had difficulties communicating with CEC staff and had to wait until the staff visited the village to voice their concerns. This has been solved to some extent because of the availability of telephones in the village.

7.3 FOOD SECURITY FOR MIRZAPUR HOUSEHOLDS

Food security for poorer rural households can come either from having food or money to buy the food, during the times they need it (see section 2.2.5). Focusing on rice and sorghum, villagers in Mirzapur have access to food from several sources.

Rice is available from own production, loans from landlords, wages from the government's Food For Work (FFW) programme, from the public distribution system (PDS), gifts from family members (see the case study reports detailed in Annexure 10), and finally from the open market.

Similarly, sorghum is available from own production, wages paid in grain from working on other farmers ' fields and from other family members, besides the open market. Sangham members get free sorghum from the leased land programme as well as slightly cheaper grain from the community storage bin.

Relative to other poor families, agricultural labour has the money from cash wages to buy food grain when required (see case study reports in Annexure 10).

The data from CEC records on sangham women (detailed in Annexure 10) allow some calculations on monthly expenditure on sorghum and rice. However, there is no data on one crucial variable – the amount of grain earned as wages from agricultural labour. Assuming that work is available for 25 days in kharif and 15 days in rabi, that only one person works per family, and that each worker earns 5 kgs of grain for a day worked (or 4 seers, where 1 seer = 1.25 kgs), the amount of grained earned as wages can be calculated. Then, for a range of assumed prices for sorghum the average expenditure on sorghum for a sangham household can be estimated (see Table 7.1 below).[26]

The data from 63 sangham members' households show that average monthly consumption of sorghum is slightly higher than that of rice (39 as opposed to 34 kgs). Aside from own production, (rice from) the PDS, and wages paid in grain, each household on average requires to buy around 96 kgs of sorghum a year (or 8 kgs per month) and 208 kgs of rice per year (or around 17kgs per month). Assuming a set of 'high' prices of Rs. 7.50 per kg of sorghum and Rs. 10 per kg of rice, the average monthly expenditure for a household comes to about Rs. 250. Expenditure on sorghum alone ranges from Rs. 30 to Rs. 60 per month.

[26] These calculations are meant to be illustrative. They are hence presented in terms of averages, in the full understanding that averages hide periods of acute scarcity (like the lean periods).

Table 7.1: Rice and Sorghum Consumption, Mirzapur, 2002

All in kilograms

	Sorghum		Rice	
	Monthly	Annual	Monthly	Annual
Average consumption per household	**39**	468	**34**	408
Average contribution of different sources				
Own production	14	**172**		
Public Distribution System			**13**	156
Labour (assumed at 40 days per year)		*200*		*200*
Bought from market		*96*		*208*
Average expenditure on grain bought from market (@ Rs. 7.50 per kg of sorghum and Rs. 10 per kg of rice)	*60*	*720*	*173*	*2080*
(@ Rs. 6.00 per kg of sorghum)	*48*	*576*		
(@ Rs. 5.00 per kg of sorghum)	*40*	*480*		
(@ Rs. 4.00 per kg of sorghum)	*32*	*384*		

* Figures given in bold are calculated directly from the data (e.g., monthly consumption figures and annual production figures), while those in normal type are calculated values (e.g., annual from monthly and vice versa). Figures in italics are based on assumptions.

These figures ought to be underestimates since they exclude grain received as gifts from relatives (see the case study reports in Annexure 11) and free distribution from production on leased land. Still, Rs. 60 per month corresponds to less than 2 days wages for a single male or 1 days wage for a couple. Although even these figures are not too high, they hide the seasonality of shortage and distress. But in the absence of information on grain purchases and employment for different periods in the year, it is difficult to infer much more from the available data.

One other source of information is the case studies done in Mirzapur during the recent review. Out of the 9 households interviewed, two were well off. The information on the sorghum consumed and procured for the remaining 7 households is detailed in Annexure 11 and summarised in Table 7.2 below.

Table 7.2: Sorghum Consumption in Seven Case Study Households in Mirzapur

NAME	Sorghum grain from different sources (January - December 2001)							Total Consumed (Kgs)	Total Cost (Rs.)
	Own (Kgs)	Bin (Kgs)	Free (Kgs)	Gift (Kgs)	Wages (Kgs)	Purchased (Kgs)	Total (Kgs)		
Narsamma Tukkappa	150	0	36	72	132	200	590	600	1,200
Golla Paramma	0	0	0	0	200	100	300	300	310
Tenugu Manemma	0	200	0	0	288	200	688	600	2,000
Pulamma Tukkayya	0	0	0	0	450	100	550	480	400
Kubirabi	100	0	0	0	0	600	700	840	3,700
Paramma Narsappa	0	0	0	0	300	300	600	600	1,050
Tuljamma Golla	0	0	0	0	50	550	600	600	3,410
Average Per Year	**36**	**29**	**5**	**10**	**203**	**293**	**575**	**574**	**1,724**
Average per month	3	2	0	1	17	24	48	48	144

This Table shows that the average consumption of these 7 households is 48 kgs of sorghum per month, out of which half (24 kgs) is purchased from the market, and wages contribute the next highest share (17 kgs). The balance of 6 kgs per month comes from own production (3 kgs), or purchased from the community storage bin (2 kgs) and gifts from relatives. The average expenditure for these 7 households on sorghum alone is around Rs. 144 per month. Although it is dangerous to generalise

from such a small sample, these results contrasts with those from the data on the sangham as a whole summarised in Table 7.1 above. While the majority of the grain consumed in the household came from labour wages and own production and a minority is purchased, these results suggest the opposite. Unfortunately, this issue cannot be satisfactorily resolved without further data collection and analysis.

A larger point that needs to be reiterated, however, is that food security comes from having food from own sources and also from purchases from the market. Particularly if prices are falling and cash wage employment is available, food security can just as well be satisfied by market purchases. This seems to be the thinking behind the cropping pattern on leased lands decided by the sangham women as well, and at least the last year has demonstrated that falling prices can be beneficial to food security concerns. Whether this is the direction for the future, however, is difficult to predict.

Two other issues of importance are (1) the shift in tastes and preferences for rice and, relatedly, (2) the increased availability of rice in the villages (through the food for work programme, the public distribution system, and now, the rice credit line programme). The point here is that both sorghum and rice need to be studied together in the context of overall food security concerns in these villages.

Shifts in the tastes of the people are another issue with the lessening consumption of sorghum. Usually villagers say that they use equal quantities of rice and sorghum for their food needs. While sorghum used to come from their own cultivation, rice used to be bought both from the PDS and the open market. The present food security programme is visualised to reduce their dependency on the open market for rice where usually prices are high. But observations of the CEC staff indicate that the villagers are buying more of rice than sorghum, even when price of sorghum is less than rice. Villagers say that children prefer rice to sorghum.

These changes in markets and choices of the villagers call for a change in our approach. How concerns of food insecurity could be addressed while depending on dry land agriculture is still a question. Here sources of irrigation are limited and dependence on dry land agriculture cannot be ruled out. Whether it is possible to provide some subsidy to sorghum so that price of sorghum becomes attractive? Whether crop diversification can be one of the solutions to this is to be explored. But the scope seems limited. Strengthening the capacity of the group in coping with ups and downs and how it can be done needs to be investigated.

Given the fluctuations in incomes issue of grain on credit could be another way of addressing uncleared stocks.

7.4 NEXT STEPS

Certain specific tasks to be carried out that would help future analysis of the food security system and the working of the bin and sangham in Mirzapur (N) are listed below.

Using existing information

- Consolidation of available information (according to sangham member names: member details, fallow land cultivation (output), leased land wages & distribution (grain and cash), other wage labour (days and amounts earned in grain and cash), purchases of rice and sorghum (amounts and costs)…

- Rationalisation of names across all data sets.

- Determination of the caste-wise distribution of village

Collecting new information (Monthly/Seasonal)

- On leased land cultivation: (area, crops, output, costs, wages (how much and to whom)), revenues)
- On fallow land cultivation: (area, crops, output)
- Market Prices and total quantities: (prices of sorghum and rice, according to qualities and sources; total market inflows from different sources – preferably by day, and otherwise by week)
- Details of bin operations: (costs, inflows and prices, outflows and prices; nature of suppliers and buyers)

The following issues emerged from discussions between CEC staff and the consultants during the reporting back session of the review in January 2002.

- **Save Grain Campaign:** Some further details on the Save Grain Campaign would be useful, and a follow up for Mirzapur since they seemed interested in the programme. Mr. Jagannatha Rao of CEC has to send a letter to IGMRI to initiate this.

- **Monitoring Sangham member households:** Continued monitoring of the case study households would be useful but, given the problems with generalising from such a sample, it would be better still if some information could be collected from all Sangham members on a regular (perhaps monthly) basis. In particular, information on the source of food grain would be very useful to calculate the proportion of food grain procured from different source.

- **Monitoring Fallow Land Programme and Leased Land Programme:** It would also be useful to collect information on the progress of the fallow lands (e.g., who exactly are these cultivators, how much do they produce, at what cost, what do they do with the output, etc.), in order to ascertain the extent to which this programme is meeting the food security needs of these households.

- **Economics of production on leased lands:** It would also be good to analyse the information collected on the costs and returns of cultivation on leased lands and fallow lands, in order to estimate the nature of benefits and the relative contribution these make to household level food security.

- **Continue process monitoring of sangham:** Written documentation of events and developments in the sangham, including decisions taken, would be helpful in understanding trends and changes over time.

- **Study agricultural labour in the village:** Since it is not clear whether or not there is excess demand for agricultural labour in village, it may be useful to study this situation in the remaining project period, to assist the calculation of opportunity costs in benefit estimation (i.e., whether sangham women have a real choice of working on leased land or fallow land as opposed to working for wages on other farmers' land)

- **Study Bin Users:** Another issue that was not clear was who (and how many) cannot afford to buy grain from the bin paying cash on the spot. These may be an important category of 'ungrouped poor' in the village, who are needy but not being benefited by the bin.

- **Costs of CEC intervention:** For any discussion of replicability, it would be necessary to know how much it costs to implement and monitor such a programme. In this context, some estimates of the costs incurred by CEC (actual and potential) would be a useful thumb rule.

- **Sangham dues to CEC:** It would be helpful to have some estimate of how much was borrowed by the sangham and how much has been repaid, and from which sources of sangham funds.

- **Probe reasons for non-repayment of past loans:** Since the sangham women, especially those on the Food Security Committee, are strongly opposed to loaning grain from the bin – which was a strong argument in favour of building it in the first place, it would be insightful to find out who the defaulters were on earlier sorghum loans, and why they defaulted. Some analysis of case studies on defaulters could be useful in any further analysis on providing credit in future.

- **Strategise on decentralised sorghum management system for food security:** This may also be a good opportunity to think further on building a decentralised grain management system centred on sorghum, and, in particular, the synergies and competion that may exist between this and the rice credit line system.

There is of course the issue of whether it would be worthwhile spending the time, energy and funds to collect all this information.

In addition, there are two issues that the project needs to consider, which pertain to work mentioned in the Project Memorandum that the project undertook to carry out and which has not been done so far.

- **Comparing cost-effectiveness of grain storage options:** The Project Memorandum talks of exploring appropriate storage options – which includes individual bins, which has not been done so far. Also, the project memorandum states that a cost-benefit analysis will be carried out and it has not yet been decided when this will be done and by whom.

- **Wider set of case studies:** The project memorandum states that 'a wider set of case studies on decentralised approaches to food security and distribution implemented by other organisations in India will be undertaken. Lessons learnt from this and particularly the research with CEC will be used to develop a set of recommendations for appropriate approaches to village-level food security. While this will have specific reference to India it is anticipated that it will also highlight generic issues relevant to sub-Saharan Africa.' Again, who will do this, when and where have to be decided.

But there are two major issues that the project needs to urgently consider, in the light of these interim findings.

- **Community bins or individual bins?**

  The project has assumed so far that community bins are needed to improve the food security for the village poor. The present findings suggest that while there is a definite benefit to poor households from being able to purchase grain from the bin during lean seasons, the sangham women prefer to grow cash crops for market sale than produce grain for storage in the bin. Further, they are not too keen on lending grain on credit to the poor, or even to sell them in small quantities, given the risks and costs of these transactions. Instead, most women seem to prefer the idea of having individual storage bins in their houses where they can protect their fallow land grain output from rodents.

  Also, there is a suggestion to have a community storage structure, where individuals can store their own grain in bags, using the structure as a 'bank', from where they can withdraw as much as they want, when they have a need to, after paying a certain storage fee.

Both these options need to be investigated, which implies broadening the scope of the project from merely looking at grain storage bins that have hitherto been considered.

- **Should storage be linked with cultivation programmes?**

  To the sangham women, the chief purpose of the community storage bin constructed in Mirzapur was to store grain produced collectively through the leased land programme. Without such collective production, the sangham women were clear that they did not see any merit in such a storage structure and would not recommend it on its own to another village sangham. The question then is whether the community bin should be 'packaged' together with a community production programme like the land lease programme.

All these issues need to be urgently addressed by the project management not only to plan work for the remainder of the project period, but also to ensure that the project produces some useful results for future work on decentralised rain management for rural food security.

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ANNEXURE 1

Itinerary of Review Mission

Consultants participating in the Mission were Dr. A. J. James, Dr. B. Adolph and Ms. K. Lalita, assisted by CEC staff.

Date	Place	Activity
15 January	CEC, Hyderabad	Planning of activities and field work, apportioning of tasks, and review of available literature
16 January	CEC, Hyderabad	Review of available literature and presentation of plans to address individual tasks
17 January	CEC, Hyderabad & travel to Zaheerabad (p.m.)	Development, presentation and discussion of formats for data collection during field work in Mirzapur
18 January	Zaheerabad	Visit to Mirzapur (with Jagannatha Rao and two Social Work students seconded to CEC to study Sangham work in Mirzapur), initial contact with Sangham members and discussion of general issues concerning bin operations and leased land operation
19 January	Zaheerabad	Collection of information regarding lease land cultivation and of bin operations (inputs and withdrawals); finalisation of case study participants; and initial case studies of Sangham and non-Sangham members (with Jagannatha Rao and Social Work students)
20 January	Zaheerabad; travel to Hyderabad (p.m.)	Case studies continued; and presentation and discussion of findings with Sangham members (with Jagannatha Rao and Social Work students)
21 January	Hyderabad	Presentation and discussion of findings with CEC staff; identification of gaps and discussion of next steps
22 January	Hyderabad	Drafting of institutional findings section (K Lalita) and draft report outline (AJ James).
23 January	Hyderabad	Preliminary data analysis, and identification of existing data gaps (AJ James); finalising of case study outputs (Uma Shankari of CEC); meeting with IGMRI staff (K Lalita and AJ James)
24 January	Hyderabad	Typing in additional hand-written information available with CEC on Sangham members and fallow land production; calculation of costs of cultivation on leased land (with Jagannatha Rao of CEC)
25 January	Hyderabad	Presentation of all findings with CEC staff and Andy Hall, and discussion of finalisation of draft report

ANNEXURE 2

Details of Different Types of Storage Structures[27]

1. Straw Storage Structures

Description	Made from straw ropes, and found all over the country.
Local names	In Andhra Pradesh they are known as *puri* while in other parts of South India they are referred to by a variety of names, including *seru*, *kottai*, *pura*, *oliya* and *murai*.
Location	These are mostly outdoor structures, though indoor structures are also found, and they vary from area to area depending upon local economic and social conditions.
Capacity	3-20 metric tons
Life	5-6 months usually, but can last from 1-2 years where rainfall is low.
Advantages	Low cost of construction; can be made locally with abundantly available local material; good thermal insulation; and good cross ventilation which keeps the grain well aerated and helps it retain its original lustre, which helps fetch a good price.
Disadvantages	Susceptible to insects, moisture, rodents, fire, theft and animals.

2. Bamboo/Reed Storage Structures

Description	Basically a basket type of store, made of split bamboo or reds plaited together and plastered with mud. The floor can also be of split bamboo/reed. The construction of these structures, though uniform in most of the areas, depends on the locally available reeds, in case bamboo is expensive.
Local names	*Gade*, *gummi* and *borra* in Andhra Pradesh, and as *kommu*, *kudir*, *bhukhari*, *ponaka*, *thombai* and *vallam* in other parts of the country.
Location	Indoors or outdoors
Capacity	1 to 25 metric tons (outdoor structures) and 0.75 - 1 metric ton (indoor ones).
Life	10-15 years under normal conditions and with proper maintenance; but only 4-5 years if it is not maintained properly.
Advantages	Low cost of construction; can be made locally with locally available materials; occupies less space because of its circular shape; and, perhaps most importantly, grain retains original lustre for up to a year.
Disadvantages	Susceptible to rodents, fire and moisture (from below, even if a layer of paddy straw is placed below the grain - unless it is raised off the ground), and is not amenable to dis-infestation measures.

3. Masonry Storage Structures

Description	Commonly made of bricks or stones, these structures are usually rectangular and constructed as a part of the house. But in some places, these structures are also made using wood or bamboo. When bricks or stones are used for the construction of these structures, different materials such as mud mortar, lime mortar or cement mortar is used. Some times this structures are raised off ground on small pillars.
Local names	*Kotlu* in AP and *kalangiam*, *manaja*, *amberkani*, *vadevu*, and *kothi* elsewhere.
Capacity	7.5 – 30 metric tons
Location	Outdoor (as part of the house)
Life	Over 20 years
Advantages	Long lasting because of its sturdy build; amenable to disinfestation.
Disadvantages	Inadequate protection against rodents and moisture. Resident infestation in cracks and crevices is common.

[27] From Thimma Reddy's Literature Review, which in turn draws from Ramam, 1989, and O'Kelly, 1979.

4. Earthen Structures

Description	Usually made by the local potter using locally available clay, the structure is cylindrical except that the diameter in the middle is more than at the top and bottom. For higher capacity structures, mud rings fabricated with either burnt or unburnt clay are used.
Local names	*Kunda*, *golem* or *jadi* in Andhra Pradesh.
Location	Indoor
Capacity	0.1 to 0.2 metric tons
Life	10 - 15 years
Advantages	Low cost, since it can be made locally with locally available material; can be easily moved around because it is lightweight; can be made functionally gas tight if the top is sealed (which is suitable for storing seed grain); and safe from rodents.
Disadvantage	Being lightweight they are also very fragile.

5. Underground Storage Structures

Description	Commonly found where the water table is low, this type of storage structure has been in use for hundreds of years It is usually a dugout pit with a lining of loose straw/straw ropes and/or palmyra leaves. The floor of the structure is covered with loose straw and paddy husk. The structure is closed with loose straw and mud. Some structures are constructed as a part of the house with brick or stone lining.
Local names	*Pathara* in Andhra Pradesh
Location	Outdoors
Capacity	1 - 2 metric tons.
Life	These are not permanent and must be renewed every year.
Advantages	Reduced risk of insect attack (because of reduced oxygen levels); no risk of fire, and protection against theft (since they are difficult to locate and open), and useful in places where wood and grass to make alternate storage structures are in short supply.
Disadvantages	Susceptible to moisture from surrounding soil (which can facilitate mould growth and spoilage), difficult to empty and to clear out and can be dangerous because of accumulation of carbon dioxide if the pits are not completely full.

6. Bag Storage

Description	Normally made of B-twill jute, Hessian or hand-knitted Mesta fibbers.
Local names	*Basta*, *sanchi*, *koni*, *bhaku*, or *conocheela* in Andhra Pradesh.
Location	Indoor
Capacity	75 kg (to store paddy, sorghum, etc)
Life	2 - 3 years depending on storage conditions.
Advantages	Versatile (since they can be used to store different types of commodities); easy to handle (because of their low rate tare weight ratio); keeps grain well aerated.
Disadvantages	Inadequate protection against rodents, susceptible to cross infestation, moisture, and damage from handling with hooks, because of which frequent replacement is needed.

ANNEXURE 3

A Profile of Kollur Village

1. KOLLUR VILLAGE

The village Kollur is situated in Medak district of Andhra Pradesh. It is a part of the Jharasangam Mandal. It is situated at a distance of 20 kilometres from the nearest urban centre, Zaheerabad. It is 7 kilometres away from the Mandal headquarters. A three-kilometre cart track connects it to the all weather, blacktopped road leading to Jharasangam, the Mandal headquarter. A part of the cart track is under water for a large part of the year. Besides this, the remaining part of the cart track is in bad shape, which deters motorised vehicles to approach the village. It is no wonder that villagers point out the lack of proper approach road as the important problem facing the village.

More than 200 families live in this village. Majority of the households belong to backward castes. There are 100 Golla families, 10 Chakali (washerman), 5 Lingayath families, 4 each belonging to Waddera, Mangali (barber), Sale (weaver), 2 each belonging to Kummari (pot maker), Yerukula, Pakkeera, Bathina, Eediga (toddy-tappers) and Tenugu castes. 55 families belong to Scheduled Castes. Though there are only 2 Brahmin families and 4 Reddy families belonging to forward castes they still play important role in the village. Though they account for less than 3 percent of the families in the village they own nearly 15 percent of the agricultural land. A good chunk of the fertile land is under their cultivation, and most of the irrigation wells in the village are in their fields only.

Almost all of the households in this village depend on agriculture for their livelihood. Agricultural land in this village consists of nearly 1200 acres. About 100 acres belong to the government. This is used as pasture land. This land is also not fertile. Out of this 1200 acres only about 400 acres are fertile lands and the remaining are of inferior variety. Given the undulating nature of the land here only about 30 acres are under irrigation, and open wells are the important source of irrigation. Though a small stream passes by the village it is not of much help in irrigating the fields in the village. Only ten acres belonging to a Reddy farmer are irrigated with the stream water, that too only for one crop.

Agricultural operations start from the months of April and May. During these months land is tilled to prepare it for sowing once monsoon rains commence in the month of June. Usually between June and November villagers get enough work in the fields. The agricultural operations come to an end by the month of January. Before June and after January women get very limited or almost no work opportunities in the village. During busy season labourers go to neighbouring villages in search of work. Work in sugar cane harvesting is available in the months of January and February. While male labourers are paid Rs. 30 per day as wages, women are paid Rs. 10 – 15 only. This difference in wage payment is attributed to smaller number of hours worked by women. Some times they are also paid in kind, 4 – 5 kgs of sorghum per day.

Sorghum, green gram and pigeonpea are the important crops grown in this village. Under wells sugar cane is raised. Wheat is sown in a small area. Paddy is not cultivated in this village. They buy rice from the ration shop and open market. The villagers usually buy broken rice, which costs about Rs. 6 per kg. They buy this rice from weekly market of Jharasangam, which is held on Mondays. They don't buy rice according to the price that is buying more when price is low and less when prices are high. They buy according to the money/income in their hands. They purchase sorghum only when its price is lower than broken rice.

Credit facilities are hard to come by. The formal credit facilities are not accessible to them. For credit they have to depend on local moneylenders who charge exorbitant interest rates. They have to pay interest of 36 percent, i.e., Rs. 3 per Rs. 100 per month, while in the formal credit institutions it will be about 18 to 24 percent.

Though some families in the village belong to service/artisan castes, with the decline of rural artisan occupations they also depend on agriculture labour for their living. The Madiga caste one of the Scheduled Castes, people are traditionally leather workers they no longer depend on it as the industry produced leather goods have entered the villages against which they cannot compete. People from Chakali caste lived on washing clothes. They used to be paid annually for their service by the households who utilised their services. Now this arrangement has come to an end. As a result of drying of this source of income they also turned to agriculture labour for survival. People from Kummari caste who are traditional pot makers have stopped doing this, as it no longer met their income needs. They some times sell pots made in other villages. Sale caste households are weavers by caste. They no longer weave cloths. The four Sale families in the village do retail business in cloths. Waddera caste people depend stone/earth work for their living. They still depend on it for their survival. As adequate work is not available in the village theirs is a permanent migratory living. They go to other places including Hyderabad and Mumbai in search of work. Golla families who constitute nearly half of the village are shepherds by profession. They still depend on it for their living. Compared to other families, particularly from the backward castes, they are economically in a good position.

As the avenues of employment are meagre in the village almost all families except those belonging to Brahmin, Reddy and Lingayath castes resort to migration in search of work and livelihood during lean season.

2. PROBLEMS

It is the absence of good approach road to the villagers that bothers many. The absence of protected drinking water supply and hospital facility is also felt in the village. In other words villagers want provision of infrastructure facilities like road, irrigation, power supply, communication facilities like posts and telephone, protected drinking water, health facilities both for humans and animals. Invariably provisioning of such infrastructure facilities will have its positive impact on the lives of the people of the village. Obstacles in the availability of services crucial to agricultural operation like timely and easy availability of credit, quality seeds, fertilisers and pesticides are felt in this village. Though there is a branch of a nationalised bank and a cooperative credit society in the Mandal headquarter Jharasangam it is not within the reach of the farmers of the village. Without influence it is not possible to obtain credit from these formal credit agencies. Other extension facilities are also not available to the farmers here. As a result of this a proportion of the agricultural land is kept fallow. Once a piece of land lies fallow it is difficult to bring it under cultivation again as it involves more expenditure. Removal of these impediments will go along way in improving agricultural production. Absence of new employment opportunities in the village like absence of training for tailoring and milk centre to cater to the needs of milch cattle maintaining households are also pointed out by the villagers

3. SEASONALITY AND FOOD SECURITY

Life in the village hinges on the rainfall. It influences the food security during that agricultural year. Rainfall is spread over a four-month period starting from June and extending up to September. During some years there also occur summer showers during May. It helps in land preparation and this will not be of much use for sowing. Sowing follows rains during the month of June. During this season Kharif crops are sown. Crops sown during this period will be ready for harvesting after August. Winter/Rabi crops are sown after September. These are grown using residual moisture in the land as well as winter dew.

Harvesting and crop arrivals commence during or after the month of August. The crops to be first harvested are green gram and black gram. Green gram is the important source of protein in the diet of the villagers In October their staple crop Sorghum will be harvested. During December Coriander and Pigeonpea crops are harvested. While Coriander is a spice crop meant for market Pigeonpea is another

important source of protein in the food consumed in the village. Harvesting of Pigeonpea will often extend into January. In fact crop calendar do not fallow this regularity. To a great extent it depends on timely and sufficient rains. Rabi crops Bengal Gram and Wheat are harvested during February.

Work availability in agriculture is closely related to these agricultural operations. Work availability is more during the month of July because of inter crop operations like weeding. Though agricultural operations begin in May they do not offer much scope for wage employment as this work is mostly related to tilling of the land, which does not involve much wage labour. Work is also available during August. Work availability will be more again in October, which happens to be the harvesting season for Sorghum, crop. From this month onwards work availability will be declining gradually till February when agricultural operations come to an end, and along with it scope for employment in agriculture. During the months of March, April, May and June the availability of work in the village is almost nil.

Most of the households in this village belong to the small and marginal farmer class. Some of the households are land less. Small and marginal farmers cannot depend on their lands for their income/food requirements. They have to hire themselves, both male and female members of the household, out for wage labour. This shows that food security of the most of the households depends on the work/income available in the agriculture. Given the agriculture cycle these families will be in a food insecure position during the months from March to June. Again some of these families will be in a precarious position before the harvesting is over as their access depends on the harvesting. This usually happens during the months of August to October.

Though the PDS scheme is there in the village it does not address the food security problem completely/comprehensively. Rice available from PDS outlets meets only part of their total food consumption. Even if rice is available in the outlet if the beneficiary household does not have money in hand to purchase it is as good as no rice.

In the absence of adequate employment opportunities in the village migration to other places like Mumbai and Hyderabad is an important mechanism to cope with adverse food security situation. Paradoxically, migration starts in the month when work availability is more in agriculture i.e., October. This trend will continue up to the month of May when migration will reach peak. In between those who have gone on migration will be returning now and then depending on the work on their own fields. Almost all the families except big landowners resort to migration. The migrants will start returning with the onset of monsoons in the month of June. As the surpluses available from own or wage labour is meagre there is no other alternative to migrating during lean seasons.

Apart from migration resort to debt is another mechanism to cope with food insecurity. Though there are two reasons for resorting to debt lack of alternative income sources is the predominant one. The families who have cultivating lands contract debt to meet the input expenditure. This usually takes place during the months of June and July. This again depends on the onset of monsoons. The debt incurred during the months of April, May and September is to tide over the difficult food situation. During April and May work availability is nil. Also it is during these months that occasions like marriage take place. During the month of September work availability is low in the case of those in search of wage labour and in the case of those depending on cultivation they have to wait for one more month before harvesting. In order to tide over the situation they also take recourse to debt. In sum, lack of availability and access are forcing the people in to the debt trap.

4. AVAILABILITY OF FOOD GRAIN

The availability or source of food grain also informs us about its accessibility, given the precarious income position of the villagers. The villagers buy a substantial proportion of their food requirements from the market. The much talked about government supported PDS plays marginal role in providing accessibility as the food grain made available through its outlets are not sufficient to meet the food

requirements of the people. Again only rice is available from the PDS outlets while the staple food here is Sorghum. Through the PDS only 15 to 20 kgs of rice is provided per family per month while requirement is about 60 kgs. For the remaining they have to source them either through own cultivation or through market purchases. Given the smaller land holdings the people have to access the market to obtain their requirements.

Sorghum is the staple food in this village and also the important food crop. There are two varieties of sorghum. While a good proportion of yellow sorghum is obtained from own fields, some more quantity is purchased from the market. Most of the white sorghum is obtained from their own fields and only a small quantity is purchased in the market. This also shows the preference of the villagers; they prefer yellow sorghum to the white one. As the paddy crop is not grown in this village the entire amount of rice is to be obtained from outside the village. While a small proportion of rice is procured from the PDS outlet in the village for the remaining quantity they depend on the open market. From the open market they normally buy broken rice but not whole rice. They go in for broken rice, as it is cheaper than whole rice. Further, their preference for broken rice depends on the relative price of sorghum in the market. Wheat production and consumption in this village is negligible. A small quantity is produced under irrigated condition. A small quantity is purchased from the market. Wheat is not supplied through PDS outlets in the village.

Among the pulses the villagers mostly consume Green gram. Most of it comes from own cultivation. Another important pule variety that they consume is Pigeonpea. While a part of it comes from their own fields, another part they purchase from the market. They also consume Bengal gram, but in a very small quantity. It is consumed mostly during festivals or important occasions. Most of the Bengal gram produced is sold in the market. Pulses are not made available through PDS outlets.

Given the fact that farmers have debt burden both because of input requirement during cropping season and because of food requirement during lean season, they have to sell a proportion of the total yield to repay their debts. Proportion of the grain varieties retained for household consumption show their food preferences. In the case of yellow sorghum, which is a native variety, more then 50% of the output is retained for self-consumption. In the case of white sorghum, which is high yielding variety, less than 50% is stored for self-consumption and the remaining is sold. This retention proportion also reflects the proportion of land used for these crops. Land allotted for yellow sorghum is less than the land allotted for the white variety. In the case of pigeonpea nearly 80 percent of the output is used for self-consumption. In the case of green gram 50 percent of the output is sold. The difficulty in storing it for long time is also one of the reasons for disposing it off in the market. The proportion of land under green gram is also more than that of pigeonpea. Only 20 percent of the Bengal gram output is retained for self-consumption. The question of retaining wheat or rice did not arise as there is a little or no local production of these cereals.

5. FOOD CONSUMPTION

Normally the villagers consume a mix of Sorghum and rice, and this mix depends on prices of both of these cereals. If price of rice, particularly broken rice is lower than sorghum they will go for rice. Yellow sorghum is consumed mostly during winter, i.e., following harvesting. Its availability in market is low. On the average a ten-member family consumes 5 kgs of yellow sorghum and 2 kgs of rice during winter. In the case of 6-member family it could be 2.5 kgs and 1 kg respectively. On the average a ten-member family consumes 3 kgs of rice and 5 kgs of sorghum during summer. In the case of 6-member family the consumption would be 1.5 kgs rice and 1.5 kgs white sorghum. During rainy season also household consumption would be on similar level.

Seasonal variations in work/income would have its impact on household consumption. During the months of April and May during which work or avenues of income generation is low the cereal consumption will also be low.

6. STORAGE PRACTICES

At present the predominantly followed practice in storing grain is in jute bags. If the quantity to be stored is small mud pots are used. Given the size of the pots up to two quintals can be stored in a pot. In the case of sorghum of both varieties mostly jute bags are used for storing. In case quantity to be stored is say less than one or two quintals then they will be stored in mud pots. Pulses are mostly stored in the mud pots. In the case of rice as the quantity to be stored at a time is small mostly pots are used for its storage. There are also indications that the use of pots is on the decline. One of the reasons is that the people from the Kummari (potters) in the village had stopped making pots and they have to purchase pots from outside the village. Another reason for the decline in the use of pots is their increasing cost. In the past big baskets made of split bamboo which are locally called 'Gumme' were used extensively for grain storage. Over the period its use has stopped. Its cost has become unaffordable. Also grain stored in these was prone to rodent attacks as rodents can easily make holes in this bamboo basket, and once whole are made these are not of any use. All the investment made into these will go waste

The villagers follow traditional methods in securing the grain against pest attacks. They keep neem leaves in the bags and pots to repel pests. They also use ash for the same purpose. These days they also started using pesticide powder to act against pests. They use these methods both for the seed grain and the grain meant for consumption. Important pests that attack stored grain are weevils and Bag warms. The villagers whenever come across infestation of pests they dry it in sun. In the case of dampness and termite attack also they dry grain in the sun.

According to the villagers' experience usually pest attack starts after two or three months of storage. As a precaution against infestation grain need to be dried in sun ones or twice in a three-month period. Even when dried in sun the pests move to a shade and try to come back again. When grain is not properly cleaned also the prospects of pest attack is more.

ANNEXURE 4

A Profile of Thogapur Village

1. Mahboobnagar District

Mahboobnagar district, where the study village of Thogapur is located, is spread over 18,430 square kilometres. There are 1571 villages, which are divided into 64 mandals. Climate of the district is generally hot. The average temperature in the summer months generally varies between 100 and 109 F and touches only 50 to 60Fo in the winter months. Maximum rainfall is experienced during southwest monsoon and in the beginning of the northeast monsoon. The district has an annual normal rainfall of 754MM with 45 rainy days in a year.

The soils of this area are (1) black cotton soil derived from Deccan traps, (2) calcareous loamy soils covering the Purnlu sedimentaries, (3) red loam soils covering/derived from Dharwar schists and (4) sandy geneissic soils occurring on the granite country.

Agriculture is the important occupation in this district. Again, agriculture in this district is largely rainfed and fortunes of the peoples of this district depend on the vagaries of the monsoon rains. In this district less than 15% of the agricultural land is irrigated compared to 40% at the state level. Added to this large areas of the agricultural land is left fallow. Both the lack of irrigation and expanding fallows are making the lives of the people of this district miserable. Because of lack of employment opportunities at home many people from this district migrate to different parts of the country in search of work.

Principal crops in the district are sorghum, groundnut, castor, paddy, cotton, pigeonpea, horse gram, bajra, ragi and sunflower. Sorghum, bajra, cotton, ragi, sunflower green gram, Bengal gram and linseed are grown on regar/black soil lands. Paddy, castor, sorghum, bajra, pigeonpea are grown in kharif season on chalka soils.

Mahboobnagar is one of the most backward districts in the state. It is considered as synonym for backwardness. Out of 64 mandals in the district 20 of them are considered as backward. Outs of 192 backward mandals in the state 20 of them are in this district. In development ranking Mahaboobnagar is ranked last (22). In rural poverty Mahaboobnagar is ranked 21 out of 22 districts and 41 percent of the rural population are poor.

According to the 1991 census the population of the district is 30.77 lakhs. Over the past decade the population grew by 25.87%. Only 29.58 % of the population are literate. In female literacy it is ranked 22. In this district 13.87 percent of the rural females are literate while at the state level it is 24 percent. In Mahaboobnagar district 38.63 percent of the school going age are only enrolled compared to 47.07 percent at the state level. While 48 percent of the boys are enrolled only 29 percent of the girls are enrolled. 10 percent of the male children and 18.7 percent of the female children are working.

In Mahaboobnagar district 42.2 percent of the girls married at age less than 18 years. Only 61 percent of the expectant women had safe delivery and only 65 percent of the children are fully immunised.

Some efforts are also launched by the state government to address the conditions prevailing in social sector. In the education sector to address the problems besetting primary education District Primary Education Project is launched. This project aims at improving enrolment and retention. As a part of improving people's participation in the programme Village Education Committees (VEC) are being formed, which are being elected by the villagers Already, 2355 VECs are formed.

Under the Development of Women and Children of Rural Areas (DWCRA) programme efforts are being made to empower women and improve their income earning capacity. Under this programme 7282 Self Help Groups (SHG) are formed by the village women in this district.

Through the Public Distribution System food security related issues are addressed. Under PDS in this district there are 6,46,101 ration card holders/families. Out of this 4,96,651 are white cardholders and remaining 1,49,450 are pink cardholders. This district is allotted 83,412 quintals of food grain to be distributed among ration cardholders during the year.

2. KOSGI MANDAL

Kosgi Mandal in which one of the study villages is located is one of the 64 mandals in Workers district. Kosgi mandal consists of 23 villages. Population of the mandal according to 1991 census is 34,510. Literacy rate in Kosgi mandal is 17% only compared to 20% in the district.

Out of the total working population of 22,032; 16,915 are working in agriculture. This shows that agriculture provides employment to 77% of the working population. In other words, agriculture is the important source of living in Kosgi mandal.

In Kosgi mandal while net sown area amounted to 24 thousand acres, fallow lands extended up to 10 thousand acres. This shows that nearly one third of the agriculture land is under fallows. In this mandal 1,318 acres irrigated out of the net sown area. Irrigated area accounted for 5.75% of the net sown area. This is less than the proportion of irrigated area at the district level. This shows that in this agriculture is mostly rainfed. This points to widespread poverty in this area.

In rainfall also, the mandal receives less than the district average. While at the district level annual rainfall is 750mm, in Kosgi mandal annual rainfall is 520mm only. This has its direct impact on agriculture and living condition of the people.

Principal crops grown in the mandal are paddy, sorghum, groundnut, ragi, Bengal gram, and vegetables. Except paddy and vegetables and to some extent groundnut all other crops are rainfed crops and are usually grown during kharif season. Bengal gram is grown on black soils during rabi season.

3. THOGAPUR VILLAGE

Thogapur is one of the 23 villages in the Kosgi mandal of Mahaboobnagar district…. It is located at about 45 km distance from the district headquarters town and five km from the Mandal headquarters.
Thogapur village in Workers is selected as the sample village representing SAPAP (UNDP) villages. This village is selected as sorghum is the important food crop, and women's groups organised by the SAPAP teams are active in the village. The selection of the village is finalised after getting the consent of the members of the women's groups.
To elicit information target group discussion method is adopted. In the course of discussion issues related to village socio-economic structure, village institutions, food security, impact of seasonality and storage practices and needs.

Caste is the indigenous SHG of the village. Intra and inter caste cooperation and hostilities are the stuff of village life. Occupation, employment and thereby food security are by and large determined by one's caste, although 'secular' occupations have come up through education in industry and service sector.

Thogapur is multi caste village. Not less than 19 castes live there. The multiplicity of castes is an indicator of a substantial agricultural surplus and this is thanks to the existence of a large irrigation

tank called Dandam Cheruvu. Out of 1000 acres of command area under this tank 270 acres lies in Thogapur and the rest in Kosgi, nearby town and mandal headquarter. Yet for a variety of reasons (tank not filling up, small holdings, high indebtedness, lack of full employment, low prices and wages) people are living a hand to mouth existence.

Caste	No: of households in the Village
Madiga	35
Mala	10
Budiga Jangala	5
Erikala	25
Waddera	10
Uppera	3
Mangali	5
Chakali	5
Kammari	4
Atakari	10
Eediga	8
Kuruba	35
Golla	10
Pinjari	10
Tenugu	150
Balije	2
Kapu	12
Brahmin	1
Muslim	15

In this village more than 300 households belonging to 19 castes/communities live together. The social and economic structure that characterises the Indian villages is also present in Thogapur village. While forward castes particularly Brahmin and Kapu households own large chunks of land people belonging to other castes, backward and scheduled castes, though own small patches of land have to finally depend on the landed households for their livelihood. One exception may be the Tenugu caste households. Because of their numerical strength they hold influence in the village. Some of the households of this caste also own large agricultural holdings.

The Reddys have much less influence than before. There was even a Harijan sarpanch for many years. The present sarpanch is a BC from Telaga caste. Many changes have taken place but people are nowhere near achieving food security.

The lone Brahmin family owns nearly 400 acres of agricultural land. Kapu families own 10 to 100 acres of land. Some families in the Tenugu caste own 40 to 90 acres. The families from other backward castes and scheduled castes own 0.5 to 10 acres. Those who own 10 acres and more from these castes are very less. Most of these households obtained lands through distribution of government lands. Nearly half of the households, particularly belonging to backward castes and scheduled castes do not own any land.

Agriculture in this village is predominantly rain fed. A proportion of the cultivated land, nearly one fifth is irrigated. Main source of irrigation is the tank. Of recently wells and bore wells have become important source of irrigation. If a well has good prospects of water, even three crops are raised in an year. In this village important crops are sorghum, paddy, ragi, pigeonpea, and groundnut. The cotton crop is a new entrant…

Agriculture is the predominant occupation in this village. Though there are professional/artisan castes like mangali, chakali, kammari their lives also predominantly depend on the fortunes of agriculture. Households from Atakari caste are involved in Tussar silk spinning. Families of the Eediga caste are

engaged in Toddy tapping. Some households from Kuruba caste are engaged in sheep rearing. Budiga jangala families are itinerant by nature. They stay in the village during good monsoons and in other times they move around. They are also folklorists.

Except the families belonging to forward castes and a few from backward castes, particularly Tenugu caste all others have to take up wage employment in others fields for living. As large sections of households' own only small patches of land, they could not depend on their own lands for survival. Besides this, agriculture in this area being heavily dependent on monsoons and other seasonal factors they are not sure of round the year employment. Agricultural work comes to end in the month of March. Important Telugu festival that comes in this season Ugadi marks this season. After Ugadi they have to go in search of other source of employment/ income earning. Collection of neem seed and fuel wood for sale in the nearby big village Kosgi is one such alternative. Another and much talked about alternative is migration to big cities like Mumbai and Hyderabad to work in construction industry.

Employment availability, hence food security in this area is highly seasonal and is intertwined with the prospects of agriculture, which in turn depends on rains. Agriculture work in this village starts with the onset of rains in the end June or early July. Work availability for those dependent on wage labour also starts from this period. Work in this period is mostly related to land preparation. Followed by land preparation sowing crops is taken up. Those who have small patches of lands but who do not own bullocks have to hire them and its availability depends on the bullock owner's own work needs. Depending on this these householders also go in for wage work in others fields. Usually by the end of August sowing will be completed. It is during this season that people's position regarding food security is stable/positive. Between August and October people mainly find work in inter-cropping and weeding. Between October and December depending on the timing of owing harvesting and threshing are taken up. Work availability for those looking for wage employment is good in this season. During this period, in the harvesting operations workers are paid in kind as a share of the harvested grain. It is during this period that people try to gather as much grain as possible. Because once the harvesting operations are over the availability of work becomes meagre. Their food security position during the rest of the year depends on the grain that they have collected/earned during this season. Once the harvesting season is over the availability of work becomes less and less. In the fields under well irrigation work will be available, but only for a few. In the irrigated fields paddy is raised and in the dry land sorghum, ragi, and pigeonpea and in some fields groundnut is sown. Usually by end February or early March agriculture operations comes to an end in the whole of the village. Once the agriculture work is over they go in search of alternative employment prospects for which are negligible. In other words, food security of majority of the people in this village becomes precarious with the end of the agricultural season because of lack of other alternatives. The only alternative left is to change their food intake/habits in consonance with the food stock available with them.

Food security of different sections of the villagers depends on their endowments. Food security is a matter grave concern for landless, small and marginal farmers who have to depend on wage work on others fields. The position of the medium and large farmers is nothing much to worry and their position becomes worrisome in case rains fail and drought sets in. Those families who have alternative sources of income like families in Kuruba caste who are involved in sheep rearing and Atakari caste who take up spinning of Tussar silk are also comfortably placed with regard to food security. Irrigation Tank in this village is the important common property resource. Only those who own land under its ayacut enjoy its utility. In the case of others it is common property in namesake only. Food security position of those who own land under this tank is relatively better compared to others as they are assured of one crop.

The food grain market, particularly its price fluctuations, also influences food security of the village people. Food grain prices during harvest season will be less and the same will increase some times beyond the reach of the people during lean season the period when people's need for food grain is more. During the lean season people are affected by both lack of income and high food grain prices… Though wage income is the main source of income for majority of the families in this village wage rates are quite low. Until some time back female labourers were paid Rs. 10 to 15 only. Only recently

it was increased to Rs. 20 to 25. This happened after the women's sanghams started paying new rates for the work initiated by it….

Though there is Public Distribution Scheme in this village it does not meet the food needs of the families. Under the present scheme each family gets only 20 kgs of rice per month, while they need on the average more than 60 kgs for a family of 6 members, which can e taken as the average size of the family here. For the remaining food grain they have to access market. Besides, the kind wages system, which was in vogue in the past, is now replaced by money wages. Only during harvest period they get kind wages in the form of a share of the harvested grain. For the work done during other seasons they get money wages. So once PDS grain is exhausted or is not available because of the malfunctioning of the PDS system they have to go to the market to get food grain. Another important feature of their access to the food grain in the market is the fluctuation in the prices of the food grain. While the prices of food grain are low during agricultural season, they rise sky high during the lean season, the season during which they are vulnerable as far as food security is concerned. For during this period their incomes are low, and rise in the prices of food grains will become further problematic and as such they are affected by both the factors.

4. STORAGE IN THOGAPUR

To store small quantities of grain that is up to two quintals the villagers use earthen pots, which in the local parlance is called 'golem'. To store grain of about 10 to 15 quintals storage structures made from bamboo, which in the local parlance is called 'Gummelu'. To store even larger quantity they use under ground structures called 'gaadelu'. But now a days gaadelu are not used much.

Now a days jute bags and polythene bags in which they get supplies of fertilisers are mostly used for storage.

The villagers also facing pest problems while storing grain. In the case of paddy a winged pest called kokku in the local parlance attacks it. In the case of sorghum it is attacked by nalla purugu, a pest in black colour. When pest attacks the grain they usually dry the grain in sun. If the grain is to be stored for a longer period they mix neem leaves and ash in the grain before storage. They follow this method both for seed grain as well as that meant for eating. In the recent past they also started using pesticide in the case of seed grain storage.

They also come across spoiling of grain from dampness, which lead to formation of fungus…. Only precaution is to be taken by way of properly drying the grain and see that storage areas in the dwellings are free from dampness.

From their experience, the villagers think that if the grain is stored in airtight containers like golem or gummelu or gadelu the grain is prone to attack from pests. If they are stored in jute bags where air passes through , the grain is usually free from pests.

The villagers think that rodents are not of much problem. Though there are rats, mice are not to be seen.

In the case of the members of the women's sangham from whom this grain storage programme is meant the choices are limited in the storage of grain of the quantity of 30 to 70 quintals. Their houses are too small to store so much grain. A good proportion of the house will be occupied by stored grain. There is no other alternative than storing it outside the house.

The present storage practices followed in the village are also not suitable to store that much grain. Golems are suitable only for storage of small quantity of grain. Gummelu cannot be used in open spaces. It cannot withstand the elements of nature, particularly rain. So, there is need to design structures that are suitable to their needs and practices.

5. UNDP APPROACH

South Asia Poverty Alleviation Programme (SAPAP) is in operation since mid-1996 in 6 Mandals in Mahaboobnagar district of Andhra Pradesh. Kosgi Mandal in which Thogapur village is located is one of these Mandals. The programme seeks to operationalise the concept of social mobilisation to form the centrepiece of all poverty alleviation strategies pursued by Governments. It seeks to advocate the need for establishing and reorienting the existing institutions to act as sensitive support mechanisms, - independent of the government though supported by it - and have commitment and be identified with the poor.

The Project approach focuses on obstacles that perpetuate poverty, with objectives of removing them and enabling the poor to overcome their conditions. Three significant elements of the approach are: to see the poor as subjects and partners in the effort for poverty reduction, to recognise the creativity of the poor, their capacity to enterprise, and to accord the poor the respect and dignity as partners in development.

The Project strategy relies on:

- *Social Organisation of the poor*. This is facilitated through a process of social mobilisation;
- *Skill development* to nurture inherent capacities and potentials and widen the basket of opportunities and choices for the poor to choose for their development; and
- *Capital formation* for improved quality of life and overcoming hunger, destitution and deprivation on a sustainable basis through judicious capital investments.
- *Social mobilisation, which* enables the poor to build their own organisations in which they participate fully and directly on all the issues concerning the poverty. Social mobilisation is the fulcrum around which this poverty alleviation project revolves.
- *Formation of Self Help Groups* and initiation of thrift and credit activity forms the entry point for their activity in the village. Each village will have many SHGs, which in turn will be federated under Village Organisations. These SHGs besides the thrift and credit activities also discuss various strategies for enhancing their income generation opportunities.

Village Organisation: As the SHGs mature in to self managed units, they have realised that there are many things, which cannot be handled by small groups. All the SHGs in each village federated into a Village Organisation (there are about 5-10 groups in each village when the Village Organisation is formed). The Village Organisation in the project area symbolises the collective strength of the poor. They have critical mass to give visibility to the organisation of the poor. The village organisations are focusing on the issues, which the SHGs are not able to handle at the SHG level. All members of the SHG in the village are the members of the Village Organisation, which meets once in a month.

Mandal Mahila Samakhya: Another important feature of SAPAP is the evolution of Mandal Mahila Samakhyas as federation of the village organisations in the Mandal. The Samakhyas have evolved into truly community based Organisations to secure to the poor proper flow of government services, through their interface with the Mandal level government machinery. The project has built the capacity of Mandal Mahila Samakhyas to lobby for the rights and entitlements for the poor.

Capacity Building: The project has focused on building the capacities of the SHGs/VOs/MMSs. Some of the important capacities building interventions are: leadership training, financial management, community health, sanitation, agriculture, livestock management, asset management and networking.

Capital Formation: The Community Organisations striving for tangible change in their lives, need to build their own capital.

In the Thogapur village this SAPAP programme is in operation for the last four years. At present there are 14 women's SHGs in this village with a total membership of 163. The members are largely drawn from Scheduled Castes and Backward Castes. While some of these members come from landless

families others families own between 0.10 acres to 9 acres. Most of them own less than 2.5 acres. Only seven out of 163 families own more than five acres. While there are five landless families, 112 families own less than 2.5 acres. A Village Organisation is formed to network all the SHGs in the village.

One of the important activities of the SHGs is savings and credit. It has helped them to save themselves from the clutches of the village moneylenders and also plan independent activities. Activities under this programme provided an identity for women and through which they have gained confidence. The VO has emerged as a financial intermediary and as an institution developing linkages between government programmes and SHGs of women in the village.

Of recent years the focus of the poverty alleviation programme of the Project is to promote sustainable livelihoods of the people living in dry land ecological areas. As a part of it a food security programme through cultivation of sorghum crop, which is the staple diet in this region, on marginal/fallow lands is taken up.

In the first year of the food security programme the women's groups plan to lease 10 acres for cultivation of sorghum. In the next year they plan to extend it to 20 acres. On the average sorghum output per acre will be about 4quitals… So, the storage need will range after deducting the wage payments from the output will be in the range of 30 to 70 quintals.

6. OBSERVATIONS BY UMA SANKARI

All the (90) families interviewed reported that they eat both rice and sorghum in a 50:50 proportion for at least two meals a day. Workers often eat four times a day. On the whole rice consumption is a little more than sorghum.

Rice and sorghum rotis are eaten with pulses. Vegetables are not an important part of the diet. Poor people often do with just chilly gravy.

Except three families, all the others reported that they purchase grain. In the case of many families, although the grain they produce may suffice through the year, they sell grain at harvest time to pay back debts, and later to buy grain during the lean season.

The lean season is from Ugadi (end March) to Sravanam (end August), particularly the months of March, April and May, when both employment is low and food grain reserves are also low. This produces tremendous stress. This is the season when they would require food assistance most.

Most households have land under the tank. Almost every one, both farmers as well as workers said if only the tank would fill up cultivation would be actively resumed and they can take two crops if not three. The tank does not fill up as easily as before, and they blamed it on insufficient rain.

The tank is under the management of minor irrigation department. Nobody had gone inspected the feeder channels except the Sarpanch who had a different view on the matter. He said the supply channel breaches now and then, the government gives contracts to close the breaches, the contractors close them with earth, and they get washed away during heavy rains. If the feeder channels are lined with cement and concrete at the vulnerable points there would e no problem.

The SHGs have got two percolation tanks constructed, and there have been immediate benefits: the lands in which sorghum used to be grown, are now under paddy.

Well irrigation is not common. Bore wells are a recent phenomena and they too are not common. Dry lands suffer from frequent crop failures. In the last 3 years there has been crop failure. They feel

reviving the tank is the only permanent solution. There were repeated requests to us to take initiatives in that direction.

The soil is of two types – black soil and sandy soil. Black soil is better for both wet and dry crops since it retains moisture better. Sandy soil is porous and does not give good yields, except perhaps in groundnut.

A few families of SC and ST and BC categories have been assigned some land near the hill. Very few cultivate them because the soil is very poor and it is not worth the trouble. However, the same people have come forward to put their land under cultivation under fallow land scheme because they would e getting assistance towards capital costs. A few targeted beneficiaries have started clearing the land of trees and pebbles and are enthusiastic about cultivating them.

I did not see much livestock although some families do have buffaloes and bullocks. Sheep and goat were visible as also a few pigs. Poultry was not to be seen. I saw black and white TVs in many houses.

A lot of seasonal migration is going on to Bombay, Pune and Hyderabad in construction work. This is especially true of agricultural workers, marginal farmers and service castes. The wage in these places is about 50 to 150 Rs. where as in the village it is Rs. 15-80 per day. But migration distorts their family and social life. One dalit family for the sake of children's education decided not to go, instead took a loan from the SHG and invested in a bore well. When I was there they harvested and brought home 25 bags of paddy from one acre.

Every one was very positive about the idea of grain banking. The existing PDS serves them to the tune of one third of their requirement. In fact, since they eat rice and sorghum in equal proportions they would welcome a scheme involving both cereals.

They have not given much thought to storage structures. They have gone and seen the scheme at Zaheerabad and they think it is a very useful scheme. They have even shown a place where storage structure can be constructed. But the merits and disadvantages have not been actively considered, e.g., problems of different varieties and qualities of grain, what should be the size etc, have not been thought of. They have big earthen pots for storing grain. Otherwise they store in jute bags. They were saying in the past storage pests were not as much a problem as now.

Every one felt very positive about SHGs. However, a few women complained that Sowcars are not lending them money because they said 'you people are getting loans from your sangams. Why should you come here?'. But in sangham you have to wait till one loanee pays back the loan, before another can avail of it. Secondly, it also cannot be a large loan.

ANNEXURE 5

Detailed Costs of the Community Storage Bin in Mirzapur

1. CONSTRUCTION COSTS

1.1 Materials Cost

	Material	Quantity	Units	Original Unit Cost	Original Costs	Current Unit Cost	Current Costs
1	Cement	49	bags	120.00	5,880	135.00	6,615
2	Steel	532	kgs	16.15	8,592	16.85	8,964
3	Sand	300	cubic feet	13.00	3,900	15.00	4,500
4	Gravel	300	cubic feet	12.00	3,600	14.00	4,200
5	Bricks	500	bricks	1.50	750	2.00	1,000
6	Stones	500	stones	1.00	500	1.00	500
7	Outlet	1		275.00	275	300.00	300
8	Inlet	1		220.00	220	300.00	300
9	PVC Pipe	1		87.00	87	80.00	80
10	Paint	2	litres	150.00	300	175.00	350
TOTAL					24,104		26,809

1.2 Labour Cost

	Items	Activity	No: of Persons	Days	Original Rate/day	Original Cost	Current Rate/day	Current Cost
1	Mason	Construction, roof, plastering	1	43	100.00	4,300	150.00	6,450
2	Female Labour	Filling of basement	20	1	20.00	400	30.00	600
		Curing	1	20	20.00	400	30.00	600
		Roof	20	1	20.00	400	30.00	600
		Helping mason	1	43	20.00	860	30.00	1,290
3	Male Labour	Carrying stones	1	10	40.00	400	50.00	500
		Roof	2	1	40.00	80	50.00	100
TOTAL						6,840		10,140

1.3 Other Costs

Head Details	Original Cost/ day (Rs.)	No: of Days	Original Cost (Rs.)	Current Cost/ Day (Rs.)	Current Annual Cost (Rs.)
Transport					
6 trips @ Rs. 100 per trip + Rs. 50 extra			650		650
Free transport provided			650		650
Supervision (CEC)					
1 person @ 10 days/month for 2 months	50.00	20	1,000	50.00	1,000
Supervision (IGMRI)					
1 person for 15 days in 3 months; travel, food & lodging	150.00	15	2,250	180.00	2700
Miscellaneous					
food & travel of labour, etc.			500		500
TOTAL			5,050		5,500

1.4 Repair Costs

Since the bin in Mirzapur was not constructed as best as it should have been, certain repairs are necessary to improve its operation. The cost of these improvements, as estimated by Shri. Jayaraj from IGMRI, Hyderabad, are given below.

Item	Details	Materials	Days	Rate/day	Cost	Sub-Total
Outlet	Mason		1	200.00	200	
	Woman		1	30.00	30	
	Sub-total					230
Inlet lid	Moulded lid	600			600	
	Mason		2	200.00	400	
	Male labour		2	50.00	100	
	Cement	1	bag	140.00	140	
	Sub-total					1,240
		Amount	Units	Rate	Cost	
Air tight sealing	Inlet; 'putty' (once in 3 months)	2	kgs	20.00	160	
	Outlet; paper sealing (tie up polythene bag)				0	
	Gas proof paints	5	litres	300.00	1,500	
	Painter (400sft x Rs. 3)	400	Days	3.00	1,200	
	Sub-total					1,660
TOTAL						3,130

1.5 Total Construction Costs

(all in Rs.)

Cost Components	Original Costs	Current Costs
Materials Cost	24,104	26,809
Labour Cost	6,840	10,140
Other Construction Costs	5,050	5,500
Repair Costs		3,130
TOTAL	35,994	45,579

2. ANNUAL OPERATION AND MAINTENANCE COSTS

Details	No: of Persons	Pay per Month (Rs.)	No: of Days Worked	Rate/ Day (Rs.)	Days on bin work	Cost/ Month (Rs.)	No: of Months	Annual Costs (Rs.)
Bayamma (2 days out of 8 days paid per month)	1	300	8	37.50	2	75	12	900
CEC person (2 days per month)	1	1,500	30	50.00	2	100	12	1,200
IGMRI person (Travel + per diem: 1 day a month)	1			500.00	1	500	12	6,000
Fumigation Aluminium phosphate (@ 3 x 13 gms, say 40 tabs)							3	240
Plastic sheet (given by IGMRI)	1					200		200
Rent of tarpaulin (to put under sorghum while drying)	1			50.00	3	150		150
Female labour (for drying before filling the bin)	15			30.00	1	450		450
Female labour (for sun drying)	12			30.00	3	1,080		1,080
Male labour (for sun drying)	2			50.00	3	300		300
Male labour (for filling the bin)	5			50.00	1	250		250
Female labour (for filling the bin)	3			30.00	1	90		90
TOTAL								10,860

ANNEXURE 7

Details of the Leased Land Programme in Mirzapur (N), 1999 – 2001

All amounts in acres

Year	Lessee	Kharif							Rabi							
		Green Gram	Paddy	Sorghum	Red Gram	Black Gram	Fallow	Total	Chana	Dhania	Linseed	Saff-Lower	Red gram*	Sorghum	Fallow	Total
1999	Sankarappa	2	2					4	2	2						4
	Kasinath	5		4	(4)			9	4	1	(1)		4			9
TOTAL 1999		**7**	**2**	**4**		**0**		**13**	**6**	**3**	**0**	**0**	**4**	**0**	**0**	13
2000	Sankarappa	2		2				4	2	2						4
	Kasinath	5		4	(4)			9	5			(5)	4			9
	Soor Reddy	6		3	(3) (1)	1	3	13	3				4	4	2	13
TOTAL 2000		**13**	**0**	**9**		**1**		**23**	**10**	**2**	**0**	**0**	**8**	**4**	**2**	26
2001	Kasinath	7				2		9	5			4				9
	Soor Reddy	8		3	(3) (2)	2		13	2	1	(1)		5	5		13
TOTAL 2001		**15**	**0**	**3**		**4**		**22**	**7**	**1**	**0**	**4**	**5**	**5**	**0**	**22**
TOTAL 1999 – 2001		**35**	**2**	**16**		**5**		**58**	**23**	**6**	**0**	**4**	**17**	**9**	**2**	**61**

* Sown intercropped with sorghum in kharif, but harvested in rabi.

ANNEXURE 8

Beneficiaries of the Fallow Land Programme in Mirzapur, 1999 - 2001

Kharif 1999			Kharif 2000			Kharif 2001		
S. No.	Name	Wife of	S. No.	Name	Wife of	S. No.	Name	Wife of
1	Sangamma	Sivayya	1	Sridevi	Madhavreddy	1	Nirmallamma	Sivaraj
2	Paramma	Narsayya	2	Sangamma	Sangareddy	2	Pentamma	Sivayya
3	Mugulamma	Thukkayya	3	Bichamma	Chandragunda	3	Paramma	Dharmareddy
4	Beebamma	Basheermiya	4	Gangamma	Thuljayya	4	Padmamma	Basanna
5	Bagamma	Ambayya	5	Sankaramma	Saapayya	5	Mugulamma	Manigonda
6	Narsamma	Vittal	6	Boomamma	Islappa	6	Poolamma	Thukkayya
7	Manamma	Lingayya	7	Basamma	Babu	7	Manamma	Malayya
8	Thuljamma	Ramayya	8	Manamma	Rasanna	8	Lingamma	Dhoolayya
9	Narsamma	Veerayya	9	Akkamma	Amrut	9	Gangamma	Thuljayya
10	Lingamma	Bashappa	10	Ratnamma	Esayya	10	Anushamma	Narsappa
11	Balamma	Beeshappa	11	Shankaramma	Shayanna	11	Malamma	Malayya
12	Nagamani	Manayya	12	Sidamma	Nagashetty	12	Balamma	Bichappa
13	Narsamma	Bichayya	13	Mugulamma	Thukkayya	13	Sooshamma	Bichappa
14	Bichamma	Bichappa	14	Narsamma	Balayya	14	Ramalamma	Ramareddy
15	Pentamma	Sivayya	15	Durgamma	Sivagonda	15	Vittalamma	Gourareddy
16	Poolamma	Thukkayya	16	Bichamma	Iswarayya	16	Chandramma	Mugulayya
17	Nagamani	Bichayya	17	Suvarnamma	Ramulu	17	*Sangham bhoomi*	
18	Bayamma	Thukkayya	18	Sidamma	Mohanreddy			
19	Thukamma	Manayya	19	Sangamma	Ralagunda			
20	Suseelamma	Sivayya	20	Nirmallamma	Sivaraj			
21	Pochamma	Sanjeevulu	21	Kubrabi	Tayirmiya			
22	Paramma	Manik	22	Rasamma	Hanumathappa			
23	Yadamma	Siddayya	23	Padmamma	Basavaraj			
24	Premalamma	Mugulayya	24	Sivamma	Narasimhulu			
25	Ratnamma	Pasayya	25	Saradamma	Eranna			
			26	Chandramma	Maisappa			
			27	Malamma	Manayya			
			28	Jangadevi	Rachayya			
			29	Satyamma	Beerappa			
			30	Premalamma	Chandrareddy			
			31	Yadamma	Nagayya			
			32	Pentamma	Sivayya			
			33	Beeramma	Gourareddy			
			34	Ramalamma	Ramareddy			
			35	Lallamma	Narsappa			
			36	Narsamma	Veerareddy			
			37	Poolamma	Thukkayya			
			38	Kamalamma	Veerareddy			
			39	Thejamma	Manayya			
			40	Neeshamma	Soorayya			
			41	Sooramma	Hanumathappa			
			42	Malamma	Malappa			

Kharif 1999	Kharif 2000			Kharif 2001
	S. No.	Name	Wife of	
	43	Thuljamma	Vittalreddy	

	44	Nagamani	Shamulu	
	45	Bichamma	Bichappa	
	46	Shantamma	Sangayya	
	47	Galamma	Beeragunda	
	48	Kamalamma	Kishanreddy	
	49	Thuljamma	Ramayya	
	50	Moulanabi	Khasimsaab	
	51	Sulekamma	Salagrama	
	52	Bayamma	Thukkayya	
	53	*Sangham bhoomi*		
Total: 25	Total: 53			**Total: 17**

ANNEXURE 9

Profits from Cultivation of Main Crops in Mirzapur

Jagannatha Rao of CEC and A.J.James calculated these costs for a standard acre of land in Mirzapur, in January 2002. The calculations assume a normal rainfall and average soil and cultivation conditions. Prices assumed are for the last kharif and rabi season. Although it would have been much better to carry out these calculations with real data from farmers , this is next best. Hopefully, such information will be collected in the time remaining in the current project.

The data are for the four main crops taken in the agricultural year: (1) sorghum intercropped with pigeonpea in Kharif; and (2) green gram in kharif; and (3) chana and (4) sorghum in rabi.

As mentioned in the text (see Table 5.7 in section 5.5.2 on page 40), the basic calculation is of profits per acre of land. The profit calculations take into account paid cash and grain costs, but not interest on working capital and land revenue charges (which are a small proportion of total costs). Thus,

A point to note is that human and bullock labour costs are paid in grain and these are not included in the calculation of costs since they are deducted from total output before sale. Labour wages have first claim on the harvested produce, followed by the bullock man's share, which is 25% of the remaining produce. Thus, for example, if output is 100 quintals and labour wages are 12 quintals, the bullock man gets 25% of the remaining produce (100 – 12 = 88 quintals), i.e., 22 quintals.

The final output taken for sale on the market is 100 – (12 + 22) = 66 quintals. Value at the market price, this gives Revenue. Thus, if price is Rs. 5 per quintal, Revenue is Rs. 330. From this amount the market agent's commission of 2% is deducted, and Total Cash Revenue is thus Rs. 330 – Rs. 6.60 = Rs. 323.40.

The calculations in the spreadsheets appended below are the following:

Costs = [All costs paid in cash]

Revenue = Price x [Total output in grain – Costs paid in grain]

Cash Revenue = Revenue – Commission

Total Revenue = Revenue from Main Product + Revenue from By Products

OR {Price x [Total output in grain – Costs paid in grain]}
– Commission
+ Revenue from By Products

Profit = [Total Revenue] – [All Cash Paid Costs]

OR {Price x [Total output in grain – Costs paid in grain]}
– Commission
+ Revenue from By Products
– All Cash Paid Costs

Crop	GREEN GRAM	Intercrop		Area	1	acre	Season	Kharif	2001

I. COSTS

		Labour						Cash	Materials						Cash
S. NO.	ACTIVITY	M/F/B	Number	Days	Own	Rate/day	Cost	Paid	Details	Quantity	Units	Rate	per?	Cost	Paid Costs
1	Sowing*	F	1	1	1	20	20	0	Seed	5	kgs	35	kg	175	0
2	Fertilizer application						0	0	DAP	20	kgs	10	kg	200	200
3	Weeding*	F	15	1	15	20	300	0							300
4	Harvesting*	F	15	2	15	20	0	0							
5	Marketing						0	0	Trolley auto	1	bags	20	bag	20	20
							0	0	Hamali (Cartage)	1	bags	5	bag	5	5
*Paid for in grain		M = Male; F = Female; B = Bullock									**Total Cash Paid Cost**				**525**

II. REVENUES

Main Product	Green Gram			
	Amount	Units	Balance	Units
Total Output	200.00	kgs	200.00	kgs
Threshing	10.00	(5%)	190.00	kgs
Seed	10.00	kgs	180.00	kgs
Wages	37.50	kgs	142.50	kgs
Bullock	35.63	kgs	106.88	kgs
Revenue (@ Rs. 1500 per quintal or Rs. 15 per kg)			1,603	Rs.
Commission (2%)	32.06	Rs.		
Cash Revenue			**1,571**	**Rs.**

Total Revenue	**1,571**	**Rs.**

III. PROFIT **1,046** **Rs. /acre**

Crop	SORGHUM	Intercrop	PIGEONPEA	Area	1	acre	Season	Kharif	2001

I. COSTS		Labour						Cash	Materials						Total Cash
S. NO.	ACTIVITY	M/F/B	Number	Days	Own	Rate/day	Cost	Paid	Details	Quantity	Units	Rate	per?	Cost	Paid
1	Tractor ploughing						0	0	Tractor**	12	litres	50	litre	600	200
									Sorghum seed*	5	kgs	30	kg	150	0
2	Sowing*	F	1	1	1	20	20	0	Pigeonpea seed*	2	kgs	40	kg	80	0
3	Fertiliser application						0	0	DAP	20	kgs	10	kg	200	200
4	Weeding*	F	15	1	15	20	300	300							300
5	Spraying	M	1	1	1	100	100	0	Pigeonpea spray	1	litres	300	litre	300	300
		F	2	1	2	20	40	0		1	litres	300	litre	300	300
6	Fertiliser application						0	0	Urea	20	kgs	5	kg	100	100
7	Harvesting*	F	10	2	10	20	0	0							0
8	Marketing (Sorghum)						0		Trolley auto	2	bags	20	bag	40	40
									Hamali (Cartage)	2	bags	5	bag	10	10
9	Marketing (Pigeonpea)						0		Trolley auto	1	bag	20	bag	20	20
*Paid for in grain		M = Male; F = Female; B = Bullock							**Once in 3 years				**Total Paid Cash Cost**		**1,470**

II. REVENUES

Main Product **Sorghum**

	Quantity	Units	Balance	Units
Output	400.00	kgs	400.00	kgs
Threshing	40.00	(10%)	360.00	kgs
Seed	10.00	kgs	350.00	kgs
Wages	100.00	(5 kg/pd)	250.00	kgs
Bullock	62.50	(25%)	187.50	kgs
Revenue (@ 400 per quintal or Rs. 4 per kg)			750.00	Rs.
Commission (2%)	15.00	Rs.		
Cash Revenue			**735.00**	**Rs.**

By-product 1 **Pigeonpea**

	Amount	Units	Balance	Units
Output	100.00	kgs	100.00	kgs
Seed	4.00	(double)	96.00	kgs
Wages	16.50	kgs	79.50	kgs
Bullock wages	19.88	(25%)	59.63	kgs
Revenue (@ 1,325 per quintal or Rs. 13.25 per kg)			**790.03**	**Rs.**
Commission	16	2%		
By Product Cash Revenue (Pigeonpea)			**774.23**	**Rs.**

By-product 2 **Fodder**

Quantity	200	Bundles
Price/bundle	1	Rs.
Revenue	200	Rs.
Total Revenue	**1,709.23**	**Rs.**

III. PROFIT **239** **Rs.**

Crop	CHANA (CHICKPEA)		**Area**	1	acre		**Season**	Rabi	2001

All costs in Rupees

I. COSTS		Labour						Cash	Materials						Cash	Total
S. NO.	ACTIVITY	M/F/B	Number	Days	Own	Rate/day	Cost	Paid	Details	Quantity	Units	Rate	per?	Cost	Paid	Cash Paid

1	Sowing*	F	1	1	1	20	20	0	Seed*	25	kgs	20	kg	500	0	0
2	Fertiliser application						0	0	DAP	25	kgs	10	kg	250	250	250
3	Weeding	F	10	1	10	20	200	200								200
4	Pesticide application								Spray	1		100	spray	100	100	100
									Chemicals	0.5	litre	200	litre	100	100	100
5	Harvesting*	F	10	2	10	20	0	0								0
6	Marketing						0	0	Trolley auto	2	bags	20	bag	40	40	40
							0	0	Hamali**	2	bags	5	bag	10	10	10
	*Paid for in grain	M = Male; F = Female; B = Bullock							**Cartage			**Total Cash Paid Cost**				**700**

II. REVENUE

Main Product **Chickpea**

	Amount	Units	Balance	Units
Output	150.00	kgs	150.00	kgs
Threshing	7.50	(5%)	142.50	kgs
Seed	25.00	kgs	117.50	kgs
Human Labour Wages	25.00	kgs	92.50	kgs
Bullock Wages	23.13	kgs	69.38	kgs
Revenue (@ Rs. 1,600 per quintal or Rs. 16 per kg)			1,110.00	Rs.
Commission (2%)	22.20	Rs.		
Cash Revenue			**1,087.80**	**Rs.**

Total Revenue	**1,087.80**	**Rs.**

III. PROFIT

388	**Rs. /acre**

Crop	SORGHUM		**Area**	1	acre		**Season**	Rabi	2001

I. COSTS

		Labour						Cash	Materials						Cash	Total
S. NO.	ACTIVITY	M/F/B	Number	Days	Own	Rate/day	Cost	Paid	Details	Quantity	Units	Rate	per?	Cost	Paid	Cash Paid
1	Sowing*	F	1	1	1	20	20	0	Seed*	5	kgs	40	kg	200	0	0
2	Fertiliser application						0	0	DAP	20	kgs	10	kg	200	200	200
3	Weeding	F	10	1	10	20	200	200								200
4	Harvesting*	F	8	2	8	20	0	0								0
6	Marketing								Trolley auto	2	bags	20	bag	40	40	40
									Hamali**	2	bags	5	bag	10	10	10
	* Paid for in grain	M = Male; F = Female; B = Bullock							** Cartage			**Total Cash Paid Cost**				**450**

II. REVENUES

Main Product Sorghum

	Amount	Units	Balance	Units
Output	200.00	kgs	200.00	kgs
Threshing (7.5%)	15.00	kgs	185.00	kgs
Seed	10.00	kgs	175.00	kgs
Wages	48.00	kgs	127.00	kgs
Bullock	31.75	kgs	95.25	kgs
Revenue (@ Rs. 700 per quintal or Rs. 7 per kg)			666.75	Rs.
Commission (2%)	13.34	Rs.		
Cash Revenue			**653.42**	**Rs.**

By product Straw

Quantity	150	bundles
Price/bundle	2	Rs.
Revenue	**300**	**Rs.**
Total Revenue	**953.42**	**Rs.**

III. PROFIT **503** **Rs. /acre**

ANNEXURE 10

Details of Sangham Members in Mirzapur (N)

These data have been collected by CEC from the members of the Mahila Sangham in Mirzapur (N). The following information is available:

I. HOUSEHOLD DETAILS

1. Name of the Sangham Member and husband's name
2. Caste
3. Household size: Number of adults (male and female) and children (male and female)
4. Number of literates (adults and children)
5. Occupation
6. Type of house (kutcha or pucca)

II. AGRICULTURE

7. Land holding (in acres) of black and red soil plots separately
8. Extent of irrigated land (acres), (only black soils are irrigated)
9. Extent of fallow land (acres)
10. Extent of leased in land (acres)
11. Output of crops (basically, green gram, sorghum, chickpea and sugarcane)

III. FOOD GRAIN CONSUMPTION

12. Monthly consumption of rice
13. Monthly consumption of sorghum
14. Annual consumption of sorghum
15. Monthly consumption of PDS rice

IV MARKET ACCESS

16. Market yard used to sell agricultural produce
17. Shandai used to buy household necessities

V. SOCIO-ECONOMIC INFRASTRUCTURE

18. Whether member of a DWCRA group
19. Amount of loan taken from banks
20. Interest rate of loans from banks
21. Amount of loan taken from money lenders
22. Interest rate of moneylender loans
23. Household assets (goats, goat kids, cows, buffaloes, bullocks, cycles)
24. Whether living in government-provided housing
25. Whether a panchayat member

VI. EMPLOYMENT

26. Number of months when employment is available in the village
27. Months of migration

VII. SANGHAM MEMBERSHIP DATE

28. Date of joining the Sangham**ANNEXURE 11**

Case Studies from Mirzapur

These case studies were carried out in Mirzapur as part of the review mission on 19 and 20 January 2002 by consultants Dr. Barbara Adolph, Dr. A. J. James, K. Lalita, along with Jagannatha Rao and Uma Shankari of CEC and two social work students working temporarily with CEC, Uma Maheshwar Rao and **XXX**.

1. NARS.AMMA, W/O TUKAPPA

(Case study done by Jagannatha Rao and Barbara Adolph)

Family background

NaRs.amma has been a sangham member from the beginning. Her family consists of herself, her husband, her son, daughter-in-law, and four grandchildren. She is suffering from poor eyesight and even with glasses she cannot see well. She does not go for wage work. Her husband is getting old and is not going for full-time wage work any more as well.

Farm and production

They own 2 acres of dry land, which they use to cultivate sorghum and green gram. The land is poor quality and yield is low. They cultivated the following:

Year	Area	Crop	Production
1998	2 acres	Yellow sorghum	400 kg
1999	2 acres	Green gram	?
2000	1 acre	Sorghum	300 kg
	1 acre	?	?
2001	1 acre	Sorghum	200 kg - out of this paid 50 kg as wages to workers
	1 acre	Green gram	?

The own sorghum is consumed from January to March, and again in November / December, supplemented by sorghum from wage work. This years' kharif sorghum was blackened and they had to pay a large proportion to the workers, as it was difficult to harvest.

Grain consumption

The family requires on average 50 kg of rice per month and 50 kg of sorghum. The children prefer rice; they eat hardly any roti. They eat rawa or bread for breakfast and rice for lunch and dinner. During the monsoon period (July / August), the adults eat more sorghum, because this is good for health during this period of high disease incidence (fever and stomach upsets). Grain consumption has changed during the last 10 years Five to ten years ago, they used to eat 80% sorghum and 20% rice, because rice was expensive. Now that rice is available through PDS and even the market price is low, they eat 50% rice and 50% sorghum. If rice was cheaper, they would eat even less sorghum - only she and her daughter-in-law would still eat *roti* and all the men and children would eat only rice.

Grain purchase

12 kg of rice is bought monthly from the PDS, provided the dealer is supplying it. In October 2001, he did not and they could not purchase PDS rice. Rice and sorghum are bought at the local *shandai / anwadi*. There are two such markets at a distance of 4 and 5 km. These markets have been there for a long time. Transport costs have gone up from 4 and 8 Rs. (for purchases up to 10 kg and for purchases of monthly supplies, respectively) to 10 and 20 Rs. She purchased 40 to 45 kg in bulk in April, and 40 to 50 kg per month in August, September and October.

Prices

Sorghum prices are 4 Rs. for white sorghum and 5 Rs. for yellow sorghum; it used to be 2 and 3 Rs. respectively (before CEC).
Rice is 5.50 through PDS, and 8 in the market. The highest rice price is around May (9 Rs.) and the lowest now (December 2001 / Jan 2002) at only 6.50 per kg.

Grain as wages

They got 72 kg (5 to 5.5 kg per day) of sorghum in March as wages for working on the rabi crop, and again 60 kg in November for the kharif crop. Some of this is still in their house (stored in bags).
Grain from sangham / bin

Even though she is a sangham member, she did not purchase any grain from the bin in 2001, because she did not have cash to purchase a large quantity and the sangham requires immediate cash payment. Therefore she went to the market frequently and purchased small quantities, whenever she had money. She did not raise this issue in the sangham meeting for two reasons: (a) it is against the sangham rules to buy grain on credit, and (b) people often do not pay back when taking grain on loan. In fact certain sangham members have taken grain on credit and never paid back - it caused a lot of quarrels in the sangham. She bought two times 50 kg from the bin in 2000.
She and her husband are participating in two land lease schemes, but so far they only got 30 kg of blackened kharif sorghum in November 2001, 6 kg of rabi sorghum in March 2001, 20 kg of kharif sorghum in November 2000, and a few kg of chick pea and green gram.

Benefits from sangham

So far there have not been many benefits. She did not get a solar light or a buffalo, but she is still hoping to get. From the land lease programme, most of the crop was sold to pay for the inputs, and they did not get any wages from it so far. However, she hopes that they will produce 20 bags of rabi sorghum this year, which can be given to the members

Other sources of grain

Her daughter, who lives in another village that has black soil, sent her 72 kg of *sai jonna* (rabi sorghum) in June, which they consumed in June.

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)							Total Consumed	Price (Rs. /kg)	Transport Costs (Rs.)	Total Costs (Rs.)
		Own	Bin	Free	Gift	Wages	Purchased	Total				
1	January							0	50			
2	February							0	50			
3	March			6		72		78	50			
4	April						50	50	50	5	50	300
5	May							0	50			
6	June				72			72	50			
7	July							0	50			
8	August						50	50	50	5	50	300
9	September						50	50	50	5	50	300
10	October						50	50	50	5	50	300
11	November	150		30		60		240	50			
12	December							0	50			
Annual Total		**150**	**0**	**36**	**72**	**132**	**200**	**590**	**600**			**1200**
Monthly Expenditure												**100**

2. RAMA REDDY, H/O RAMALAMMA

(Case study done by Uma Shankari and A J James)

Family background

They are not sangham members, but would like to become one. He hopes to get crop loans and access to labour and tractors through the sangham, as well as buffalo loan. His family consists of himself, his wife, and three children who are all below 15. Five years ago, he had two children less.

Farm and production

They own 5 acres of land, out of which 3 acres are irrigated with a bore well, that was drilled two years ago. On the 3 acres he is growing only sugar cane; he plans to rotate it with green gram. On the two acres dry land he is growing chickpea and sorghum (rabi), green gram and sorghum (kharif). Generally he gets 400 kg of sorghum per year during the kharif season. He usually sows the traditional yellow sorghum variety, because he grows it for his home consumption. He sometimes sells the kharif sorghum in anticipation of a good rabi production. This might not work, because the rabi sorghum production can be low / fail. It happened in 1998

Grain consumption

The family requires now on average 50 kg of rice per month and 30 kg of sorghum. Five years ago they required 250 kg of sorghum and 300 kg of rice per year.

Grain purchase

He seldom buys sorghum. He does not have a PDS card and therefore does not buy rice from the PDS. He buys rice from Hadnoor market (usually 50 kg per month, Hamsa variety, at on average Rs. 8 per kg, range 7.50 to 8.50).

Expenditure

He and his family spend 1500 Rs. per month on items that he purchases, including milk and vegetables (he does not have cattle and does not grow vegetables).

3.GAUR REDDY, H/O ETTAMMA

(Case study done by Uma Shankari and A J James)

Family background

They are not sangham members, but would like to become one. He hopes to get crop loans and access to labour and tractors through the sangham, as well as buffalo loan. Before he also hired the tractor from the sangham and put his own diesel; he could pay in instalments.
His family consists of himself, his wife, and two adult children. One of them is living with him with his wife and two children who are both below 15.

Farm and production

They own 10 acres of land, out of which 3.5 acres are irrigated with a well / 3HP pump. On the 6.5 acres he is growing mainly paddy and sugar cane, and sometimes onion, wheat, vegetables. On half an acre of dry land he is growing chickpea and sorghum, pigeonpea, green gram, black gram, *annumulu* (bean seed). He produces 6-7 bags of sorghum per kharif season, mostly hybrid sorghum. He produces *sai jonna* in the rabi season; the yield is 3 quintals per acre, if it is a good year. He prefers *sai jonna*, but during the last 8-10 years the rabi crop has been problematic / failed. Therefore he is going now for hybrid kharif sorghum.
There are now more rats in the field now and also in the storage than before.

Grain consumption

The family requires now on average 35 kg of rice per month and 50 kg of sorghum. They eat only twice a day (late breakfast and one meal at night). He prefers sorghum, because it gives strength. They also like rice / eat it by habit.

Grain purchase

He buys 15 kg rice from PDS per month (180 kg per year). This supplements the rice from his own land.

His views on the grain bin and the sangham

He thinks the bin is good, because there is nowhere else to store the grain from the sangham. But he is not happy that the grain is still in the bin - it should be emptied out. He did not know much about the sangham and its activities, but he does not have any objections to the sangham, if they are doing good work.

Sales

He sometimes sells his own rice, if he is in urgent need of cash. But usually he does not buy or sell rice or sorghum.

Expenditure

He and his family spend 1500 Rs. per month on items that they purchase. They have visitors and workers to look after / entertain.

4. GOLLA PARAMMA, W/O MANIKAPPA

(Case study done by K Lalitha)

Family background

She is a sangham member. Her family consists of herself, her husband, her brother-in-law and four children.

Farm and production

They are landless.

Grain consumption

The family requires now on average 60-70 kg of rice per month and 25 kg of sorghum (total 300 kg per year). They eat more rice, but they like sorghum because it stays in the stomach longer.

Grain purchase

They purchase all the rice they consume (60 kg); out of this 16 kg per month comes from PDS. Once or twice they did not get PDS rice because there were no supplies. The average price of purchase for rice is Rs. 8, with the highest price around Pongal last year (9 Rs.) and the lowest around 8 Rs. They purchased 100 kg sorghum in January 2001 in the village at 3 Rs. per kg from village Reddy on credit. This is the landlord for whom they work. The cost of bringing the grain home is 10 Rs. per 100 kg. They do not store grain very long because they are buying and consuming continuously.

Grain as wage income

The wage is 5 kg of sorghum per day - they get wage work for around 45 days per years (30 during kharif, 15 days during rabi). This way they got 100 kg of sorghum as wages in November 2001 and again 100 kg in December 2001.

Grain from bin

During 1996/97/98 they got altogether 1 1/2 bags before the bin was built from the lands on lease. After the bin was build, she asked for sorghum, but Bayamma said she could take only if she paid in cash. As she did not have cash to pay, she could not take any grain from the bin.

Sangham

She does not perceive any benefits from the sangham - in fact she has quarrelled with the sangham people and keeps her distance. Bayamma told her to tell us things that don't exist (such as that she got the buffalo loan).

She did not go to Shankarappa's field for three days; instead she sent another person in her place. The sangham members abused her and she stopped going to the field after that. They don't called her any more and she does not attend the meetings any more.

She has paid Rs. 1260 to the sangham (thrift and credit) and it has been entered in her passbook. She does not know what is happening to the money. She did not get lights and buffalo loan.

Expenditure

She spends around 500 Rs. per month on general expenses (apart from food grain).

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)							Total Consumed	Price (Rs. /kg)	Transport Costs (Rs.)	Costs (Rs.)
		Own	Bin	Free	Gift	Wages	Purchased					
1	January						100	100	25	3	10	310
2	February							0	25			0
3	March							0	25			0
4	April							0	25			0
5	May							0	25			0
6	June							0	25			0
7	July							0	25			0
8	August							0	25			0
9	September							0	25			0
10	October							0	25			0
11	November					100		100	25			0
12	December					100		100	25			0
Annual Total		**0**	**0**	**0**	**0**	**200**	**100**	**300**	**300**			**310**
Monthly Expenditure												**26**

5. TENUGU MANEMMA, W/O RASANNA

(Case study done by K Lalitha)

Family background

She is a sangham member. Her family consists of herself, her husband, and four children.

Farm and production

They are landless.

Grain consumption

The family requires now on average 62 kg of rice per month and 50 kg of sorghum (total 600 kg per year). The overall food security situation is better now than before the sangham started. 5 years back they had to borrow money to eat. Children eat rice and adults prefer sorghum, because it gives strength and they can do hard work.

Grain purchase

They purchase all the rice (50 kg); in addition they get 12 kg per month from PDS. The rice they purchase is broken rice at 6.50 per kg. The price varies from 5.50 to 6.50; lowest rate is around Deepavali.

They bought 200 kg of sorghum, namely 50 kg each in January, February, November and December. The price of sorghum is now 3 to 6 Rs. / kg; it used to be 5 - 6 Rs. / kg 5 years back. It has to be paid in cash. The cost of bringing grain home is 20 Rs. per quintal for transport (plus 30 Rs. loss of daily wage).

Grain as wage income

They got 24 kg of sorghum as wages in February, 200 kg in September, and another 24 kg in November. They got the 200 kg by working 20 days in September @ 14 kg of sorghum per day (6 kg for women and 8 kg for men; there is a big and a small *adda* and different landlords use different *addas*). Sometimes they get pigeon pea as wage from land lease (5 kg once per year for 2-3 days work). They get one month of work in kharif and 10 days of work in rabi.

Grain from bin

In 2001, they purchased 200 kg from bin, namely 100 kg in June, 50 kg in August and in October. In 2000, she got 200 kg of sorghum from the bin. This was supplemented by wage sorghum and purchased sorghum. The bin is useful only for the leased and fallow land production. If there is collective farming, we need collective storage. So far, there is no problem with community storage. Buying from the bin is good, because one does not lose one day's wage, better grain consumption (?), and less hassle. Grain that they receive, as wages has to be stored individually - they don't want to put it into the bin (not quite clear why - different type of grain which cannot be mixed?)

Sangham

She gets some sorghum from lease land (around 40 kg in 2001). This is from 8 days of work @ 5 kg per day. Leasing land is good for more employment.

Expenditure

They spend around 150 Rs. per month on oil, vegetables, etc. and 66 Rs. for PDS rice. 325 Rs. is used for buying broken rice. Total expenses are around 500 to 600 Rs. per month.

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)							Total Consumed	Price (Rs. /kg)	Transport Costs (Rs.)	Total Costs (Rs.)
		Own	Bin	Free	Gift	Wages	Purchased	Total				
1	January						50	50	50	6		300
2	February					24	50	74	50	6		300
3	March							0	50			0
4	April							0	50			0
5	May							0	50			0
6	June		100					100	50			400
7	July							0	50			0
8	August		50					50	50			200
9	September					200		200	50			0
10	October		50			40		90	50			200
11	November					24	50	74	50	6		300
12	December						50	50	50	6		300
Annual Total		**0**	**200**	**0**	**0**	**288**	**200**	**688**	**600**	**24**	**0**	**2000**
Monthly Expenditure												**167**

6. PULAMMA, W/O TUKAYA

(Case study done by Umamaheswar Rao, social work student and B Adolph)

Family background

She is a sangham member. Her family consists of herself, her husband, her grown-up son, her daughter-in-law, one child above 15 and two children below 15. The son got married recently and the family is still indebted (10,000 Rs.) because of the wedding arrangements / festival. No dowry was received. They are Christians.

Farm and production

They have 0.25 acres, which is a quarter of the acre that was distributed between 4 brothers. Prior to CEC, this land was fallow / wasteland. It came under cultivation in 1998, when CEC gave a loan to use a tractor and apply DAP. Her husband knows the details of the repayments made etc.

In 2001, they did not sow a kharif crop because of late rains. In 2000, they got 50 kg of sorghum and in 1999 100 kg. She cannot remember how much they harvested in 1998 and 1997. The yield from their small plot is 50 to 100 kg, depending on rains. It is *banjar* soil and only one crop can be grown on it.

Grain consumption

The family requires now on average 90 kg of rice per month and 40 kg of sorghum (total 480 kg per year). This is calculated based on the daily consumption: 3 kg rice / day and 5 kg of sorghum every 4 days, when *atta* is made. She prefers sorghum, because it is healthy and takes more time to digest. Therefore it keeps the hunger away for longer. If the rice price decreased, they would eat a little bit more rice, but they still need to maintain a minimum amount of sorghum.

Grain purchase

They purchase monthly 80 kg of rice in the *shandai*; in addition they get 12 to 25 kg per month from the PDS. They used to get 12 kg, but their allowance was increased to 25 kg in August 2001; the supply is irregular (7 - 8 times per year only) and they did not get any PDS rice for the last three months. In the market they pay 7 Rs. for broken rice and 8 to 9 Rs. for normal rice - they purchase broken rice and whole grain rice alternately. Prices don't vary much; only the quality of the rice varies from month to month. Even during the rice harvesting time the price remains high, because the farmers keep some of the rice in store. Rice in the market has to be paid in cash.

They bought 100 kg of sorghum from the village Patil, for whom they work, on credit in July for 4 Rs. / kg. This was 2000 kharif sorghum. This loan is interest-free, because they work for him. Grain loans are always interest free with the Patil - only for money loans interest is payable.

Grain as wage income

They got 300 kg of sorghum as wages in 2000, and again 400 kg in 2001 in November. Both she and her husband worked for this. They get 5 kg of sorghum per day for harvesting. From the grain (poor quality blackened grain from kharif crop) which they got in November, they still have three bags left. Usually 4 people work for one month.
During the rabi season they get 1.24 kg (1 ser) per person per day of green gram. Usually two people work for around 15 days each.
She still has some good quality sorghum left in her house from the wages during the kharif or 2000.
They do not get rice as wages, even if working on Patil's paddy land. Such wages are in cash.
Food-for-Work programme started in 2002 in this village, but so far she has not participated.

Grain from bin

She never got any grain from the bin. Only a few poor, destitute people take grain from the bin - others like her can work to get grain as wages. She would have liked to take grain from the bin last year, but Bayamma is not giving any grain on credit. This is because about half of the sangham members would not pay back (neither in cash, nor in kind). The reason why people don't pay back is because they feel the grain in the bin belongs to CEC and not to the sangham. Therefore, if they don't pay back, CEC can wait a bit longer for their money. The sangham won't be affected. CEC is always telling them that they are a poor women's sangham - therefore they will understand if people don't pay back. "They are our sirs." As a result of half of the members not paying back, even the remaining members might not pay. There is nothing that can be done about this. One can only go to the members' houses and roam around to try and find money. One cannot even force the members to work on the lease land to pay back the loan in labour.

The bin is good to prevent rodent damage. The grain is safe in the bin, and it is good to keep it there, even if it is more difficult to take it out than from bag storage. A partition should have been built in the bin, so that both kharif and rabi sorghum can be stored at the same time. So far there has been no benefit for her from the community storage, but she might get grain in the future (once her own wage sorghum is finished).

Land lease

She got 50 kg of black sorghum grain from the land lease programme last November - this was for 4 days of her work. In 2000 she got 20 kg of green gram for four days work.

Sangham

She ranks the benefits from being a sangham member as follows:
1. She got a buffalo on credit
2. She got 50 kg of rice and some sorghum on credit from CEC in 1996 / 97.
3. Other benefits: Solar lights, saris from CEC at Christmas, able to take land lease programme (but not much returns so far - only if the rains are good they can get good employment from land lease)

She is content with Bayamma's leadership style. Bayamma is a strong leader and even if she scolds the members, this is for their own benefit.
Since the sangham has started, she has become more aware and their standard of living has improved.

Expenditure

They spend around 400-500 Rs. per month on other food items. Not much is spent on sorghum. Most of the money goes for purchasing rice - 700 to 750 Rs. per month. They spend around 10 Rs. for electricity per month and 10 Rs. for transport per week.

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)							Total Consumed	Price (Rs./kg)	Transport Costs (Rs.)	Total Costs (Rs.)
		Own		Free		Wages	Purchased	Total				
1	January							0	40			0
2	February							0	40			0
3	March							0	40			0
4	April							0	40			0
5	May							0	40			0
6	June							0	40			0
7	July						100	100	40	4		400
8	August							0	40			0
9	September							0	40			0
10	October					50		50	40			0
11	November					400		400	40			0
12	December							0	40			0
Annual Total		**0**	**0**	**0**	**0**	**450**	**100**	**550**	**480**	**4**	**0**	**400**
Monthly Expenditure												**33**

7. KUBRABI, W/O TAHIR ALI

(Case study done by Umamaheswar Rao, social work student and B Adolph)

Family background

She is not a sangham member. Her family consists of herself, her husband, and five children, one of whom is now 15. They are Muslims.
Their oldest son suffered from epilepsy and they spent 5000 Rs. on treatment in Bidar five years back. He is fine now. They took a loan from a local moneylender at 5% interest per month. She is also not well / having some growth in her stomach. The doctor in Bidar did an endoscopy two years ago and said she should have an operation, but it would cost 50,000 Rs. She is having pain, but they do not have money for the operation.

Farm and production

They cultivate 2 acres of land, which belong to three brothers, two of whom are in Hyderabad. The land has not yet been divided, so her family cultivates the whole lot and gives part of the harvest to the brothers. In 2001, they produced 400 kg of sorghum in the kharif season, out of which two bags were given to the brothers and 100 kg / one bag went for wages. From the remaining bag /100 kg, 50 kg are still left with them in their store / bags. In 2000, they harvested only 3 bags because of poor rains, and in 1999 one bag (on part of the land - rest was sown with coriander. She cannot remember how much they harvested in 1998 and 1997. Their land is suitable for rabi cultivation, and they grow chickpea during the rabi season.

Grain consumption

The family requires on average 60 to 70 kg of rice per month and the same amount of sorghum (total 720 kg per year). This is calculated from a consumption of 2 kg of rice and 2 kg of sorghum per day. Both rice and sorghum are needed. The children like to eat rice, but once they are starting to work, they will also eat *roti*. Their 15 year-old son is eating roti now, because he goes for the Food-for-work programme. As he goes irregularly and cannot do the hard work, they will get only around 100 kg of rice for two months.
Even if the rice price decreased and / or sorghum price increased, they would still eat sorghum (usual reasons).

Grain purchase

They purchase all the rice (50 kg); in addition they get 20 kg per month from the PDS. There was no PDS rice supply for the past three months. The rice they purchase costs 8 Rs. per kg. The price does not vary much, only the quality. Throughout 2001, the price was more or less that same. PDS rice is 5.50 Rs. per kg.

They bought 500 kg of sorghum in 2001, namely 300 kg each in June and 200 kg in October. In October 2000 they had bought 200 kg, which lasted until February 2001.
They buy sorghum either from farmers in the village, or, if there is no supply in the village, from dealers in Zaheerabad or Bidar. The price is the same (5 to 6 Rs. per kg for good quality sorghum), but if they buy in the village, there are hardly any transport charges. However, the farmers in the village do not sell on credit, whereas some of the dealers in Zaheerabad do. They know some of the traders, where they buy regularly, and get credit from them.
The cost of bringing grain home is 20 Rs. for transport, 15 to 20 Rs. per bag for transport, and money for the auto-rickshaw, adding up tot around 50 Rs. There is also a bag charge of 5 Rs. per bag.

Grain as wage income

They got no grain as wages in 2001, because they were busy working on their own land, and they needed to look after the children, some of who were sick. Also, there was not much work during the last kharif because of the poor distribution of rains. But usually she and her husband go for wage work

in the kharif for around 1 month; they get 5 kg of sorghum per day. During the rabi season they get 10 Rs. per day for weeding and 1.25 kg / 1 ser of pulses per day for harvesting.

Grain from bin

She would buy grain from the sangham bin, if the price was good. Her husband decides.

Sangham

She is not member of the sangham and does not want to become one for two reasons:

(1) She does not want to go outside the village because she follows the *purdah* system. Even if her husband allowed her to go, she would not want to go. Even if there were an only-Muslim sangham, she would not want to go. It is not that she does not want to join a Hindu / Christian sangham, but she does not want to go out of the village to meetings and to go to the bank and to offices.

(2) She had bad experiences with the DWCRA group. She and some other women have been part of a DWCRA group and contributed monthly some savings (total 12000 Rs. among 15 members). However, the group leader used the savings for her own personal expenses and never opened an account. She promised to pay back the money, including interest, by a certain date, but has not done so. Her family is big and if the DWCRA group members went to her house, there would be a fight. The sarpanch is not intervening - he asked the group members to just wait.

She knows that the sangham is leasing in land and that they get saris.

Expenditure

They spend around 200 Rs. per month on sorghum (average throughout the year) and 650 on rice. Another 200 Rs. minimum are required for other food items. She uses very little oil and tries to be economical with all her expenses - otherwise she would need around 500 Rs. The overall household expenses are around 1200 Rs. / month.

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)						Total Consumed	Price (Rs./kg)	Transport Costs (Rs.)	Total Costs (Rs.)
		Own		Free	Gift	Wages	Purchased	Total			
1	January							0	70			0
2	February							0	70			0
3	March							0	70			0
4	April							0	70			0
5	May							0	70			0
6	June						300	300	70	6	50	1850
7	July							0	70			0
8	August							0	70			0
9	September							0	70			0
10	October	100					300	400	70	6	50	1850
11	November							0	70			0
12	December							0	70			0
Annual Total		**100**	**0**	**0**	**0**	**0**	**600**	**700**	**840**	**12**	**100**	**3700**
Monthly Expenditure												**308**

8. PARAMMA, W/O NARASAPPA

(Case study done by Uma Shankari and Umamaheswar Rao, student social work)

Family background

She is a sangham member. Her family belongs to the beggar caste. They rotate the collection of beedi leaves among 30 members of her caste. Her family consists of herself, her son, her daughter-in-law, and her sons' five children (all under 15). One girl studies up to 2nd class, but she is going for work now; she is around 13 years old. One boy (oldest son) is 17 / 18 years and is studying in Sangareddy - he has taken a room there. They think he is studying. They are sending 500 Rs. per month to him. Four people in their family are going for wage work (three adults and one girl). They go also for construction work (wages are higher - 25 to 50 Rs. for women and men respectively). They do any kind of wage work, including Food-for-Work (see below).

Farm and production

She says that she has 0.5 acres, but sangham members say that she has three acres (not clear who is right). She never participated in fallow land programme. She has 1 acre in the hillock which has never been cultivated / wasteland. The 0.5-acre that she is cultivating is in two plots. In one, there was no rain in 2001 in the beginning, but there was unseasonal rain during harvest. Instead of four quintals, she got only 1/2 bag (50 kg), which was moulded / black. In the other bit, she put green gram, but a nearby spring flooded the field and she did not get anything. Now (rabi) she has put *sai jonna*, but it looks stunted because the soil is too wet.
In 2000, they produced 250 kg of yellow sorghum and in 1999 200 kg (this is one part of the field). In the other part, they produced 100 kg of rabi yellow sorghum in 2000 (?), as well as 50 kg of chickpea. In kharif 2000 they got 100 kg of green gram from that part. In kharif 2001 they did not get anything because of pest attack and flooding.

Grain consumption

They use 100 kg rice and 50 kg of sorghum per month. Rice does not fill the stomach.

Grain purchase

Out of 100 kg rice, 25 kg comes from PDS. The PDS rice lasts for around 8 days. The rest is purchased in small quantities as and when required (25-30 kg at a time) from Hadnoor market. The rate is 8 Rs. per kg for *hamsa* rice (whole rice, not broken). Sometimes they buy broken rice at 6 Rs. / kg. The rice price is 9 to 10 Rs. per kg on average. They got 15 days of work from FfW and were paid Rs. 30 per day in cash. This money was pooled for 15 days and they used this money to buy rice from the sarpanch at 6.50 Rs. / kg (around 200 kg of rice?). The sarpanch is managing the FfW programme. They buy sorghum at Hadnoor and local shops at 3 Rs. per kg for poor quality. They keep buying whenever they need. It costs 10 Rs. to go to the market for bus fares.

Grain as wage income

They get 300 kg of sorghum as wages for the four working adults. They go for work every day, because three of the people are young and strong.

Grain from bin

They took 50 kg in 2000, and 100 kg "after some time". To store the community rice in bin is good - it protects it from rats. Individual grain storage bins are not necessary.

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)						Total Consumed	Price	Transport Costs (Rs.)	Costs (Rs.)
			Bin	Free	Gift	Wages	Purchased	Total				
1	January							0	50			0
2	February							0	50			0
3	March						*100*	100	50	*3*	*50*	350
4	April						*100*	100	50	*3*	*50*	350
5	May							0	50			0
6	June						*100*	100	50	*3*	*50*	350
7	July							0	50			0
8	August							0	50			0
9	September							0	50			0
10	October							0	50			0
11	November					300		300	50			0
12	December							0	50			0
Annual Total		**0**	**0**	**0**	**0**	**300**	**300**	**600**	**600**	**9**	**150**	**1050**
Monthly Expenditure												**88**

9. TULJAMMA GOLLA, W/O MALLAPPA

(Case study done by Uma Shankari and Umamaheswar Rao, student social work)

Family background

Tuljamma belongs to the shepherd caste but do not do their caste occupation. She is handicapped from childhood, cannot walk, moves sitting. Her husband is an old man. He goes for daily wage work. They have a son and a daughter, the daughter is mentally retarded, the son goes for daily wage work, "if he feels like", " whatever he earns is not enough for his beedis, and drinks, he does not give us any money". So basically only one person is working and earning.

Farm and production

Landless.

Grain consumption

They use 100 kg rice and 50 kg of sorghum per month. Eat more rice than sorghum. The children prefer rice –"I don't know which is better but we need both, the proportions may differ but we need both".

Grain purchase

Out of 100 kg rice, 15 kg comes from PDS. The rest of the rice and sorghum is purchased from the *shandai* at Hadnoor, or sometimes from Zaheerabad if they go there on some work. She has never bought from the bin. It costs them around Rs. 10 to bring it home.

Grain as wage income

They get 50 kg of sorghum as wages. The husband tries to go for work every day, but he is getting old. He does only agricultural work; he cannot do any other work.

Grain from bin

She is not eligible since she is not a member.

Sangham

She is not a member "nobody told me, I didn't become one". But Bayamma said she was asked, but she replied, "From where do I get Rs. 5 every week and pay?" She thinks sangham is doing good work – "they are leasing land, growing crops, getting buffalo loans, etc- doing everything well". She does not know enough about the sangham to say anything about problems.

Expenditure

Rs. 100 per on *shandai* day, and in general, Rs. 400 per month.

Sources of Household Sorghum Consumption, and Costs

	2001	Sorghum grain from different sources (kgs)							Total Consumed	Price (Rs./kg)	Transport Costs (Rs.)	Total
		Own	Bin	Free	Gift	Wages	Purchased	Total				
1	January						*50*	50	50	6	10	310
2	February						*50*	50	50	6	10	310
3	March						*50*	50	50	6	10	310
4	April						*50*	50	50	6	10	310
5	May						*50*	50	50	6	10	310
6	June						*50*	50	50	6	10	310
7	July						*50*	50	50	6	10	310
8	August						*50*	50	50	6	10	310
9	September						*50*	50	50	6	10	310
10	October						*50*	50	50	6	10	310
11	November					50		50	50			0
12	December						*50*	50	50	6	10	310
Annual Total		**0**	**0**	**0**	**0**	**50**	**550**	**600**	**600**	**66**	**110**	**3410**
Monthly Expenditure												**284**