

The Asuramunda Experience:
A report on the Vertical Shaft Brick Kiln
project implemented by Gram Vikas



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Gram Vikas is a rural development organisation working with the poor and marginalised communities of Orissa since 1979, towards making sustainable improvements in the quality of life of the rural poor.

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Soma Dutta

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project implemented by Gram Vikas, Orissa**

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Executive Summary

Gram Vikas is a voluntary agency working with the rural poor of Orissa for more than two decades. It is one of the partner agencies in the India Brick Project (IBP), supported by the Swiss Agency for Development Cooperation (SDC). The IBP attempts to transfer, adapt and improve a successful Chinese brick production technology, the Vertical Shaft Brick Kiln (VSBK), in India. As one of the initiatives under this project, Gram Vikas has been supporting the village community in Asuramunda in the Bolangir district of Orissa to establish and manage a VSBK.

Gram Vikas's interest in the IBP

Gram Vikas's interest in the SDC supported India Brick Project stems from its objective to improve the livelihoods of unemployed youth and traditional brick moulders who migrate seasonally to different parts of India during the brick-making season, to work as greenbrick moulders. The other families, even though they do not migrate, find it difficult to eke out a livelihood from the limited resources available locally. Thus the VSBK is viewed as a livelihood option that would help create stable employment for moulders and their families, who are otherwise subject to sub-human living conditions as well as other traumas of being uprooted from their own surroundings for extended periods of time. By empowering and building the capacity of the Asuramunda village community, Gram Vikas also intends to test the hypothesis that *suppliers of labour can effectively become owners of capital*.

Gram Vikas's experimentation with the VSBK technology, can be divided into two distinct

phases: (a) **Technical Action Research Phase** at village Konkia, which was aimed at validating the potential of the VSBK technology under different soil-market-climate conditions in India and evaluating its performance in comparison with conventional

practices. (b) **Social Action Research Phase** at Asuramunda, which was conceived as the logical next step wherein the experiment involves setting up a village based enterprise around a VSBK, to be fully owned and managed by the community, with handholding support from Gram Vikas.

Technical Action Research Phase: the Konkia experience

The Konkia VSBK, which was constructed in 1997, helped to establish that the technology is viable in local conditions. Producing an average of 600,000 bricks every year, it was able to streamline the production process over the years. Some of the achievements of the Konkia experiment are as follows:

- The time taken for loading and unloading operations was reduced from 30-35 minutes to 15-20 minutes and from 20-25 minutes to 10-15 minutes, respectively.
- Breakage reduced to 1.5-2% from 5.2-10.3% per 1000 bricks.
- The use of clamps for transporting and stacking hot bricks was introduced.
- Masons learnt to carry out repairs and regular maintenance.

Unfortunately, the kiln went through a number of vagaries of nature such as cyclones etc.,

because of which it had to be shut several times. The kiln also faced a problem because of the poor quality clay at the site. Later on, clay was brought in from another site, but this resulted in increased costs. However, at that time, achieving commercial viability was clearly not considered one of the objectives of the experiment. In fact, the only parameter on which familiarity was gained was the operation of the kiln itself. Even within this, while many people learnt how to operate the kiln, not much attention was given towards incorporating the other wherewithal like material management, inventory control, labour management etc., which are equally necessary to optimize any production process

The Konkia experiment yielded some important lessons that were not envisaged initially.

- Gram Vikas was exposed to a series of labour problems, which a production process is likely to encounter, given the prevalent social milieu and work culture.
- Gram Vikas was able to involve women in the various operations at the VSBK. It also experimented with engaging couples as fire team members, which reduced absenteeism significantly. The women trained in Konkia were able to handle all operations, except for unloading.
- As only one shaft was operated most of the time, firemen had spare time and they learnt moulding. Their gradual upgradation in moulding enhanced the inhouse capacity of VSBK II, while it also generated a sense of stability and belongingness among the firemen.

Social Action Research phase at Asuramunda

Gram Vikas, once it was proven that the technology is viable and usable, turned its attention to setting up a social action research unit. The purpose of social action research was to check if traditional brick making communities could build, own and manage a VSBK. In line with this thinking, GV set to selecting a village where a community owned enterprise could be set up around a VSBK. The first inquiries were around a village called Souripalli in

Boudh District. However, because of some conflicts within the village and discord with Gram Vikas over another project, this village had to be dropped.

Asuramunda in Bolangir district was the next village that came up for consideration. Gram

Vikas had been in contact with Asuramunda since 1998, since it had implemented the Rural Health and Environment Programme in the village. Asuramunda has a total of 50 households out of which 45 fall in the below-poverty-line category. The people of Asuramunda mostly depend on agriculture for their livelihood. The families work on their own lands in the village itself, except for nine moulder families who cultivate during the monsoons and leave for other districts on brick making contracts for about 6 months from December to May. After a series of discussions and a few people from Asuramunda visiting Konkia, the community agreed to go in for a VSBK in their village.

It is important to note here that even though the community owned enterprise proposed at Asuramunda was viewed as a natural progression from the technical action research phase at Konkia, it was not entirely the case. There were several parameters in Asuramunda, which were new and had to be addressed afresh:

- The VSBK brick was a new technology, as far as the Asuramunda community was concerned. Apart from a brief visit to Konkia by a few people, their prior interaction with the technology was nil.
- From a commercial angle, the VSBK brick was a new product for the local market.
- For the village community as well as Gram Vikas, the concept of a community owned business enterprise was an entirely new and an untested one.
- Apart from the novelty of the initiative itself, ideas like share capital, factory like shift-operations, marketing etc. were all new to the village community.

The VSBK Asuramunda experience

During the year 2000, Gram Vikas started initial discussions with the villagers on the VSBK idea. Five of the villagers visited Konkia in August 2000

to understand the working of the kiln. After a series of preparatory meetings, the construction of the kiln began in January 2001. Originally conceived to be a three-shaft kiln, the design had to be altered

after the third shaft collapsed due to poor workmanship and unprecedented heavy monsoon rains. Overcoming all difficulties, the kiln was finally ready by September 2001, incurring a total capital cost of Rs 6,22,071. In the present management set up, the kiln operations are managed by an operations team, consisting of five supervisors, the firing team, transporters and green brick moulders. There is also the VSBK committee, which does not participate in the day-to-day functioning of the kiln, but is responsible for strategic decisions. Gram Vikas has placed a site supervisor to support the villagers in running the kiln. Gram Vikas has been quite clear on the kind of involvement that it has with the Asuramunda community. It firmly believes that the villagers should do everything themselves, even if it means short-term compromises. Over time, its involvement has been coming down and the villagers are beginning to take major decisions on their own.

The kiln functioned from November 23, 2001 to May 20, 2002 when it was closed, as the green bricks stock got depleted. Another reason for the kiln closing down was that there was a severe shortage of labour for transporting of bricks.

As of August 2002, a total of 3,65,000 bricks had been sold, out of which 100,000 were for use under various Gram Vikas projects, 60,000 were sold to the block office and 2,00,000 to other parties. During the six months of operation, the sale price of the VSBK bricks fluctuated between Rs. 900 to 1100 per 1000 bricks, averaging around Rs. 950.

In the first few months of its operation, the most significant achievements of Asuramunda are as follows:

- **Capacity building of kiln workers:** The capacities of the kiln workers including the supervisors and the firemen have been built to an extent that they can manage the entire operations by themselves. The workers learnt many operation related aspects like temperature control, brick arrangement, working in shifts, quality of coal.
- **Capacity building of the community:** Over time,

the community has set up a number of systems for the management of the kiln as well as other management issues such as framing of rules and regulations for the VSBK, conflict resolution, crisis management etc. Executive Summary iv

- **Stabilization of VSBK operations:** The operation of the kiln itself has been stabilized after almost six months of experimentation, modifications, learning and unlearning.
- **Increased comfort level with working with a new technology:** The villagers were totally unfamiliar with the practice of working in a factory like set-up, especially working in 8-hour shifts.
- **Improved standard of life for the moulder community:** For the moulder families who used to migrate to places as far as Hyderabad earlier, working at the VSBK has brought about a significant improvement in the quality of life in many ways. They are more comfortable working in the home environment that offers familiar language, culture and more reliable family support systems, especially in emergencies. Typically, during the migration months, the migrants are not in touch with their family members back in the village (typically aged parents, small children etc.). This exacerbates their vulnerability as they are forced to deal with any emergencies (illnesses etc.) by themselves. There is a perceptible sense of belongingness towards the VSBK enterprise and an increased sense of confidence among moulders who are not forced to migrate any longer.

Issues of concern

As of now, the VSBK at Asuramunda has been operated for just about six months. It is perhaps somewhat premature to carry out a critical assessment of the process at this stage. Nonetheless, some of the key areas that need to be examined carefully at this stage are as follows:

Kiln operation

While the process of production of bricks has been streamlined at the Asuramunda VSBK, there are still some operational problems that are recurrent in nature and stem from the fact that the kiln has some basic structural problems.

Construction of the shaft: Because of constructional defects, the inner walls of the shaft are a little concave. As a result of this shape, a few bricks get jammed in the shaft on a regular basis. Bricks also get stuck in the fire-holes, which are provided along the side of the shaft walls. This problem is countered to some extent by leaving a gap along the sides of the shaft wall at the time of arranging the green bricks in the shaft.

Brick size: Arriving at the optimum brick size that would be acceptable in the local markets has been a long and painstaking exercise. Initially, the shaft size permitted bricks of 9"X4"X3" instead of the 10"X 5"X3", which is popular in the local markets. After several trials, the optimum size has now been achieved by a specific way of arranging the green bricks in shaft for firing. This however means that out of 332 bricks per layer, 16 have to be broken and arranged in a way that fills the gaps between the other diagonally bricks and the shaft wall.

Kiln management

Labour problems: In Asuramunda, labour problem has surfaced several times. Before the kiln was closed down in May, a large number of green bricks collected at the moulding site simply because there were no labour available to transport them to the kiln. The primary reason for the labour problem is that during some part of the year, other employment opportunities, which are more remunerative than the VSBK, are available in and around Asuramunda. The VSBK committee came up with a rotation system for deciding which households will go for employment outside the village and who will work on the VSBK. It is yet to be seen how this system functions.

Material management and Inventory control: In Asuramunda, the VSBK started operations in November, and by March-April, huge stocks of red bricks had been built. Unfortunately, the quality of most of these bricks was poor because till then, parameters such as temperature, soil mixture etc. had not been optimized. During the same time, a large number of green bricks were damaged due to off-season rains. By April, the stock of green bricks had depleted. At the same time, there were huge stocks of unsold red bricks. In such a situation, there was reluctance on the part of the Asuramunda community as well as Gram Vikas to

continue production.

By the monsoons of 2002 however, the scenario changed completely and the demand for bricks rose sharply. The VSBK committee managed to sell all the piled up stocks of red bricks. In fact, many contractors were willing to pay a much higher price for any bricks (up to Rs 1200 per 1000 bricks) they could get. However, by then, the Asuramunda brick stocks had been exhausted completely, having sold at an average price of Rs 900 per 1000 bricks, considerably less than what they could have fetched later.

Technically, the VSBK can operate practically throughout the year, closing only for routine maintenance. In Asuramunda, there is a need for careful inventory planning, so that (a) the kiln can be operated throughout the year, and (b) it is able to respond to the market demands as and when required.

Transportation and other losses: Gram Vikas expected a breakage rate of 1-2% - from drying to pre-loading point (Green Brick stage), 2-4% from loading in the kiln to stacking point (Red Brick stage) and 1-2% at despatch point. The actual losses have been much higher than anticipated, for avoidable reasons as well as those that were inescapable. Maximum damages were inflicted by two spells of un-seasonal rains when more than 2 lakh green bricks were washed away. The average kiln wastage (breakages, improper burning etc.) for the six months of operation has been around 13%, while the green bricks wastage has been higher at almost 20%. Transportation loss has been the other area that needs attention. As the labourers are still not fully trained in loading red bricks in the tractor, the breakage rates have been high. What however is encouraging is the fact that both these percentages have been declining consistently over the six months.

Marketing

This is an area that requires immediate attention. Even though the VSBK committee has appointed a marketing supervisor, who is responsible for the sale of bricks, marketing has largely been reactive. Interactions with contractors and masons in the surrounding areas indicates that the primary reasons why they purchased VSBK bricks are (a) as the kiln is close by, the transportation losses

are lower and (b) Gram Vikas offers convenient credit terms unlike other brick suppliers in the district. In fact, for most, these factors are just as important and influence their purchase decisions significantly. Another feedback was that till some time back, the quality of VSBK bricks was somewhat inconsistent, but this has stabilized now (corroborated by the fact that the temperature range for the VSBK, which was being experimented with till some time back, has been optimized now). It is also quite evident that the persons who are responsible for the marketing of the VSBK bricks need to be trained in marketing skills.

Credit policy

As of now, there is no specific policy on offering credit to customers. Each case is reviewed individually by the committee and to a large extent, the marketing supervisor decides on what credit terms should be offered to each customer. As of August 2002, 75% of the value of total sales was accounted for by credit sales. Of this, 45.2% was receivable due. It must be mentioned however, that ever since Gram Vikas stopped providing financial support to Asuramunda, the collection performance has improved significantly, and the committee is making significant efforts to collect dues for all sales made on credit. There is a need to set in place a policy on credit sales.

Financial performance and loan recovery

At the current level of operations, the break-even volume of sales works out at 5,97,522 bricks. This translates to an operation level of 14 lakh bricks per year, or 1.16 lakh bricks per month. Clearly, the production and sales level will have to be stepped up if the operations have to break even. Right from the beginning, it was made clear to the Asuramunda village community that the VSSBK is being financed on a loan basis. The rate of interest on the loan given will be 12% and the amount will have to be repaid in 3 years. Even though there is an implicit understanding that GV's loan has to be repaid, the repayment terms have not been worked out yet. The Asuramunda committee has not yet started paying back the loan. It was also agreed that share capital @Rs.1000 per family would be raised by all the 50 families. The contribution towards the share capital has been slow. As of

June 15th, out of Rs 50,000, Rs 6013 had been collected. According to the GV RHEP coordinator, this is a priority area right now.

Accountability systems

While the roles of the functionaries of VSBK (committee members, supervisors etc.) have been spelt out in the Agreement, there is a need for greater accountability. As of now, no systems for either rewards or penalties have been instituted.

Community dynamics

Community ownership and management has been the cornerstone of the Asuramunda experiment. In the VSBK, the community is involved at three levels:

- As workers employed in the kiln,
- Executive Summary vii As the general body that takes majority of the decisions, and
- As the executive committee that is an elected body of nine members and is responsible for decisions of an urgent nature.

At this point, there are certain community dynamics in play that need to be examined carefully. The two most important factors that govern the community dynamics vis-a-vis the VSBK are as follows:

Perception regarding the VSBK committee's role:

The VSBK committee comprises of largely elders who are not employed at the kiln in any capacity. Gram Vikas had insisted that those who were paid by the kiln for their services could not also carry out management control. According to them, this was a conscious decision and meant to serve as a mechanism for the community to keep a check on the supervisors. However, while the feeling of 'working for the village' prevails in a general sense, many of the committee members seem to harbour a feeling that they have no real stake in the VSBK operations.

Decision making balance: In the present management structure, the supervisors and the GV site supervisor are responsible for the day-to-day functioning of the VSBK. The decision-making power however lies with the committee. Now, the committee has nine members who have their own preoccupations and are not available for meetings and collective decision-making at all times. On

few occasions, this has resulted in time lost and consequent delays in decision-making. Given this situation, there is a need to review the decision making structure, especially between those directly responsible for the kiln operation and the committee.

Women's involvement

Women can be involved in VSBK operations at several levels: as transportation labourers, as kiln workers, as moulders, as committee members and as part of the general body of the village. As of now, women are involved in the VSBK operations as transporters of bricks and as part of the general village body. Some women also assist their husbands in moulding. In Konkia, women had been involved in the VSBK operations quite effectively, but this has not been done so in Asuramunda. According to the menfolk, the VSBK can provide employment only to a fixed number of persons and no more. In a situation when even the men are either not employed or are under-employed, women's employment is not a priority area. Additionally, it is difficult for women to work in shifts, especially at night.

The way ahead

The Asuramunda experiment offers valuable lessons in a variety of issues including alternative models of disseminating VSBK technology, community enterprise etc. However, as of now, the kiln has not yet run sufficiently long to make any conclusive judgements on the experiment. However, some initial deductions do emerge.

- An economic enterprise is the best driving force around which villagers can be motivated to act and come together.
- It makes practical sense to work around and build on a traditional occupation that village communities are familiar with, as opposed to introducing something entirely unfamiliar.
- Villagers, with no prior exposure to VSBK type operations, do not find it complex to cooperate.
- VSBK like operations can help enhance management skills of the communities in terms of collective decision-making, conflict resolution, tackling varied leadership styles etc.

- While it is relatively easier to train villagers in technology operation, skill enhancement on other production related aspects such as inventory control, marketing etc. requires higher investments in terms of time and effort.
- Community dynamics are best managed at the community level, with minimal interference and only critical inputs from the external agency.

Organizational challenges ahead

Focusing on 'doing business': As far as the kiln operation is concerned, there has been a greater focus on technology related matters than on the other issues fundamental to doing business. These include marketing, material and labour management etc. Now that the operations have been stabilized, Gram Vikas needs to focus on moving towards business-like operations,

Institutionalising organizational learning processes:

In an organization, there is a need to institute mechanisms to internalize experiences and incorporate learning from them, into future activities. This is particularly significant in the case of innovative, cutting edge programmes and projects with all the attendant risks and uncertainties. In the case of the Asuramunda experiment, this is an area that merits greater attention. While both components of the IBP project offer important learnings, the progress of the project has been somewhat organic and self-evolving. Additionally, the pre-dissemination proposal does not adequately cover all aspects of the proposed experiment at Asuramunda. In specific terms, the documentation indicates that some of the critical areas like material and labour management etc. were not dealt with in sufficient detail at the project conceptualization stage. As a result, some of the problem areas in Konkia continued to resurface time and again in Asuramunda as well.

Periodic documentation: At this stage, there is a need to closely follow the developments at Asuramunda. It would be useful to undertake another documentation exercise in say, 15-18 months time, by when a good part of the handing over process would have been completed by Gram Vikas. The present study can be used as a benchmark to gauge the progress made.



Section I

The Context of Asuramunda

Chapter 1 : Introduction

Chapter 2 :The big picture : The India Brick Project

Chapter 3 : Gram Vikas and the IBP

In this chapter...

✓ ***Background***

✓ ***Structure of the document***

1

Introduction

Gram Vikas is a voluntary agency working with the rural poor of Orissa for more than two decades now. It is one of the partner agencies in the India Brick Project (IBP), supported by the Swiss Agency for Development Cooperation (SDC). The IBP, which spans over a number of organizations spread across the country, attempts to transfer, adapt and improve a successful Chinese brick production technology, the Vertical Shaft Brick Kiln (VSBK), in India. As one of the initiatives under this project, Gram Vikas has been supporting the village community in Asuramunda in the Bolangir district of Orissa to establish and manage a VSBK.

Background of the study

Since the VSBK was commissioned in November 2001, it has functioned for a period of six months or so, even though the community mobilization process around the VSBK started much earlier. This experience has yielded important lessons not only for the IBP, but also for community based developmental initiatives in general. In April 2002, Gram Vikas initiated an exercise to document the Asuramunda experience. The documentation exercise is expected to provide valuable inputs regarding the processes followed so far and suggestions for ways forward. The results from the documentation will also contribute towards working out future dissemination strategies of Gram Vikas with regard to the VSBK technology.

Apart from documenting the processes that have configured the experience, the documentation exercise is aimed at testing the hypothesis that the VSBK can be promoted as a technology that

a village community can operate and manage profitably, ensuring distributive justice as well as sustainability.

Specifically the documentation examines issues related to the following:

- Community management processes, including collective decision-making, leadership, conflict resolution, distributive mechanisms, distribution of work, accountability etc.
- Financial management, including financial accountability, financial sustainability, profit levels, break-even, community's perceptions regarding financial risk in the operation etc.
- Operational issues, including design process of VSBK, production methods, quality assurance, materials management and inventory control, safety measures etc.
- Impacts on various sections of the village community, including environmental impacts, community's perception on occupational hazards.
- Project management within Gram Vikas, including long-term objective of the operation, thinking within the organization, management structure and capacities, Gram Vikas's dynamics with Asuramunda community.

Structure of the document

The report has been organized into three sections. Section I provides the context of the Asuramunda experiment and is divided into three chapters.

The current chapter serves as an introduction to the report, outlining the objectives of the study and the specific areas covered. Chapter 2 sets the backdrop and context of the present study in terms of the overall framework of the India Brick Project. It also gives a brief description of the VSBK technology. This is followed by Chapter 3, which discusses Gram Vikas's objectives from the project and its expectations from the same.

Section II focuses on the documentation of Gram Vikas's experience in the IBP. This is divided into three chapters. Chapter 4 documents the Technology Action Research Phase at Konkia, in terms of its progress, achievements and lessons learnt. Chapter 5 deals with the transition to the next phase of the project. It deals with the objectives of the proposed

Chapter 1 : Asuramunda Documentation 3 Social Action Research Phase. Chapter 6 focuses on the preparation for the Social Action Research Phase, starting with the selection of village for this phase, choice of village Asuramunda, and the processes therein. Chapter 7 traces the chronology of events in Asuramunda, starting with the background of RHEP, initial interactions and motivation around the VSBK, construction of the VSBK and setting up of management systems. It also documents the future plans of Gram Vikas with regard to the VSBK technology.

Section III is the conclusion section, which includes a review of Gram Vikas's experience in Chapter 8 and concluding remarks in Chapter 9.

2

The big picture: The India Brick Project

The VSBK technology emerged in rural China in the 1950s when a prototype was built as an improvement over the traditional intermittent up-draught kiln and disseminated widely in the rural areas. In the 1970s and 80s, China witnessed rapid investments in infrastructure, as a result of which the demand for building material like bricks increased manifold. During this period, the VSBK was widely accepted as a farmers' technology, who viewed these essentially as a source of additional income, and operated them during the agricultural lean season. In 1985, the Chinese government commissioned the Energy Research Institute at Henan Academy of Sciences to study the kiln and improve its efficiency. Research on the VSBK continued till an improved design was produced in 1988. Currently, there are around 50,000 VSBKs operating in China. Outside, China, the technology has been introduced in Nepal, Pakistan and Bangladesh. It however did not take off well in any of these countries.

Brick industry in India

Brick is an important construction sector industry in India. Even though it is difficult to estimate accurately, there are no less than 50-60,000 brick works and a total of 150,000 kilns in India. The net contribution of burnt bricks to the Indian economy is very significant. At the same time however, brick making is a major pollutant, accounting for 27% of the emissions resulting from production of all

In this chapter...

- ✓ *VSBK technology*
- ✓ *The India Brick Project*
- ✓ *The context of Asuramunda*

construction materials. The current brick firing technologies used in India are energy intensive and result in heavy particulate pollution. The specific energy consumption for bricks coupled with the large demand entails fuel consumption equivalent to over ten million tons of coal per annum. The most commonly practiced technology is the Bull's Trench Kiln with an average capacity of 30,000 bricks per day. The fuel consumption ranges from 5.1 GJ to 3.2 GJ per 1000 bricks, in different parts of the country depending on type of chimney, fuel type, soil type and firing practices. The first major step in technology upgradation in the brick-firing sector was the introduction of the fixed chimney kiln, which occurred almost three decades ago. However, even though the fuel savings are well established, only 10% of the kilns countrywide have adopted this technology variant.

The India Brick Project

SDC has been working in the fields of energy and environment for several years. In 1993, when SDC was exploring new areas in energy intensive small-scale sectors, brick, foundry and glass were identified as priority sectors. During this time, the VSBK, an energy efficient and environmentally benign brick making technology, was quite popular in China. Using the VSBK as a starting point, SDC initiated a project to introduce and adapt the technology in different agro climatic regions of the country. This was the genesis of the India Brick

Project (IBP), which was initiated in 1994 to validate the energy efficiency of the VSBK and evaluate its environmental performance. A baseline study of the brick industry was undertaken in 1995. The study, followed by a visit by the project team to VSBK sites in Pakistan revealed that the VSBK was not yet sufficiently developed as an alternative to large-scale brick production. In its present state, it was more suitable for small-scale brick production, replacing the less efficient coal and wood burning clamps. It was also felt that VSBK probably operates successfully as a family enterprise when the owner is fully and continuously involved. In line with this thinking, the Technical Action Research Phase of the IBP was launched, starting off with a VSBK model proven in China, to which changes could be made gradually.

Technical Action Research Phase

An Action Research Programme was started in 1995 with the objective of validating the potential of VSBK technology under different soil-market-climate conditions in India and evaluating its performance in comparison with conventional practices. The main project partners were Development Alternatives (DA) and the Tata Energy Research Institute (TERI), with SKAT and Sorane Sa - two Swiss consulting organizations providing technical guidance and support. Technology support for construction and operation were provided by the Chinese experts from Energy Research Institute of Henan Academy of Sciences at Zheng Zhou.

In 1996, DA constructed a VSBK at a site near Datia in Madhya Pradesh. The Datia kiln was installed on a leased land, and later sold over to the entrepreneur at a depreciated cost. The Datia VSBK experience was quite positive. For one, the quality of bricks was found to be better than those produced in the nearby clamps in terms of colour and ring. The energy consumption was less than BTKs (Bull Trench Kilns) and nearby clamp, with 50-60% fuel saving¹. The breakage rate was also low at 2-4%. Most importantly, the experiment indicated that the technology is viable with reasonable margins for the entrepreneurs. During this phase, 5 VSBKs were set up in different regions that reflected

The Vertical Shaft Brick Kiln : Structure

The VSBK consists of one or more shafts located inside a rectangular brick structure. The shafts are 1 to 1.25 metres wide with nominal lengths of 1 m, 1.5m, 1.75m or 2.0 m. In India, shaft heights have been varied to hold from 8 to 13 batches. The inside surface is a brick wall, often lined with refractory fireclay bricks. The gap between the shaft wall and outer kiln wall is filled with insulating materials - clay and rice husk, etc. Provision for peep-holes and thermocouple probes are provided along the shaft height to monitor the position of fire as well as temperature profile of the kiln (figure given in Chapter 7).

differences in many parameters such as soil, markets, agro-climatic zones etc (details given in Table 2.1).

Table 2.1 VSBKs installed in the Technical Action Research Phase

Year	VSBK	Partner organization	Location
1996	VSBK I	Development Alternatives Datia,	Madhya Pradesh
1997	VSBK II	Gram Vikas Konkia,	Orissa
1998	VSBK III	Commonwealth Trust,	India Kozhikode, Kerala
1999	VSBK IV	Damle Clay Structurals Pune,	Maharashtra
2000	VSBK V	Development Alternatives2 Gwalior,	Madhya Pradesh

In 1999, the Action Research Phase of the project was externally evaluated, after which focus of the project was shifted to how to commercialize dissemination. The project scope was also enlarged to cover the overall brick production system, including methods to improve quality of green bricks by introduction of extruders and mechanized handling systems. Subsequently, 3 more kilns were constructed in the year 2000. In

¹ Energy use in the VSBK is normally between 0.8 and 1.0 MJ/kg, as compared to 2.0-3.0 MJ/kg for clamps, 1.20-1.75 in BTKs (Bull Trench Kilns) with moving chimney, and 1.1-1.5 in BTK with fixed chimney.

this phase, many modifications were made by the Indian team for achieving better performance of the kiln and improvement in the working environment for the operators.

Pre-dissemination Phase

The India Brick Project entered the Pre-dissemination Phase from 1 July 2000, with the main objective of developing strategies for large-scale dissemination and building up capacity and support facilities needed for dissemination. It is planned to establish Lead Entrepreneurs and Technology Providers for providing technology support services, in markets where implementation by five partner organizations is being undertaken. Typically, entrepreneurs at their own cost are establishing the kilns after being convinced about the viability of the VSBK technology. The pre-dissemination phase will continue till 30 June 2003, during which 7 more VSBKs have been planned.

In terms of dissemination of the VSBK technology, three distinct strategies are being adopted:

- **Need based approach:** TERI works with Industry Associations, focusing on their needs and priorities, improvement of operating practices, training, capacity building, and networking. Two more VSBKs were built by DA in Tehanpur

and Datia in 2000. Chapter 2 : The Big Picture 8

- **Technology Transfer:** DA functions as a technology provider, its operating mechanism involving setting up of service centres in different locations for demonstration. The owner pays for the capital cost, while the technology assistance expense is borne by the project.
- **Turnkey approach:** Some of the project partners like MITCON in Maharashtra and Damle Clay Structurals operate as turnkey consultants for the technology, and the objective is complete commercialization.

In 1999-2000, a new community-based approach to dissemination was proposed by Gram Vikas, which culminated into the Asuramunda experiment, where a village community is being trained to operate, manage and own a VSBK.

A significant component of the project is the Social Action Component, which revolves around three key areas: identification of structures and initiatives in group/communities

and developing them, using traditional knowledge and incorporating gender sensitivity. Gram Vikas is a voluntary organization working in

In this chapter...

✓ *About Gram Vikas*

✓ *Gram Vikas's interest in the IBP*

3

Gram Vikas and the IBP

About Gram Vikas

partnership with the rural poor of Orissa, with the overall aim to improve their quality of life. It has staff strength of 280 persons. Gram Vikas's approach to development in Orissa, over the last 20 years, has focused on conscientising and empowering rural communities to attain self-reliance and sustain an improved quality of life. It works in the area of technology adaptation and dissemination, with a view to applying them to rural development and poverty alleviation. The key focal point of this process, which forms the crux of the VSBK project, is - to demystify and facilitate dissemination of alternative technologies among poor and marginalized rural communities in Orissa, to help them achieve a dignified quality of life signified by alleviation from poverty and attainment of sustainable secure livelihoods.

Gram Vikas's interest in the IBP

Gram Vikas's interest in the India Brick Project stems from its objective to improve the livelihoods of unemployed youth and traditional brick moulders who migrate seasonally from several districts of Orissa, especially the western region comprising Bolangir, Bargarh, Boudh and Sonepur districts.

A large number of families from villages in these areas migrate to different parts of India during the brick making season, to work as green brick moulders. In fact, the green brick moulding has

evolved as a specialized skill, developed primarily as a result of the fact that agriculture in these parts, even though the primary occupation, is totally rain-dependent, highly precarious and insufficient to meet the needs of the people. The other families, even though they do not migrate, find it difficult to eke out a livelihood from the limited resources available locally. Majority of these moulders belong to the scheduled castes and various subcaste groups. Gram Vikas views VSBK as a livelihood option that would help create stable employment for moulders and their families, who are otherwise subject to sub-human living conditions as well as other traumas and inconveniences of being uprooted from their own surroundings for extended periods of time. By empowering and building the capacity of the Asuramunda village community to own and manage a VSBK, Gram Vikas also intends to test the hypothesis that suppliers of labour can effectively become owners of capital.

Prior to its involvement with the IBP project, Gram Vikas was already involved in similar ventures, including a brick kiln at Goutikra village in Bargarh district. When the IBP was launched, it decided to get involved in the initiative, with the following specific objectives :

- Develop small scale, decentralized brick manufacturing facilities as potential rural enterprises,

- Chapter 3 : Gram Vikas and the IBP 11 Enable and build capacities of rural poor communities, who are at present moulders, to own and operate VSBK so as to facilitate maximum accrual of income from such a venture to them,
- Set up VSBKs through unemployed educated youth in areas where there is a demand for bricks, and
- Develop inhouse capability and institutional mechanism for its promotion.

In addition to the above, Gram Vikas's initiative has two important social objectives:

- Enabling the blending of traditional knowledge that exists with communities with the modern technology parameters, and
- Getting a deeper understanding of gender issues in the brick sector.

Gram Vikas's experimentation with the VSBK technology, can be divided into two distinct phases:

- The **Technical Action Research Phase** at village Konkia, which was conceived in line with the SDC's broad objective of anchoring the technology and validating its potential under different soil-market-climate conditions in India and evaluating its performance in comparison with conventional practices.
- The **Social Action Research Phase** at Asuramunda, which was conceived as the logical next step wherein the experiment involves setting up a village based enterprise around a VSBK, to be fully owned and managed by the community,

The genesis of Gram Vikas

In 1971, a group of 400 student volunteers from Madras University, associated with the Young Students Movement for Development came as relief workers, after a devastating cyclone hit the Orissa coast. After the relief work, some of the volunteers continued to stay on and work with the farmers on issues related to irrigation. They however soon realized that their efforts were being hampered by the prevailing socio-political conditions and the really poor and marginalized were not really benefiting from their efforts. In 1976, at the invitation of the district administration and the Behrampur Milk Union, they started working with the tribal people of Ganjam. Over the years, they expanded their activities to cover areas like literacy, self-governance, livelihoods and infrastructure. Over the years, what started as a localized students movement became one of the largest, successful rural development initiatives and testing ground for innovations and new approaches to rural development in the country

with handholding support from Gram Vikas. It was envisaged that the enterprise would provide continuous employment and income to the villagers, at least one-fifth of whom used to migrate to other parts of the country as green-brick moulders.



Section II

The Asuramunda Experience

Chapter 4 : Technical Action Research Phase - The Konkia experience

Chapter 5 : The next step: Social Action Research

Chapter 6 : Asuramunda – the initial steps

Chapter 7 Section II

4

Technical Action Research Phase - The Konkia experience

In this chapter..

- ✓ *Objectives*
- ✓ *Institutional arrangements*
- ✓ *Operations*
- ✓ *Key events*
- ✓ *Lessons learnt*

Objectives of the Technical Action

Research phase - VSBK II

In the context of the IBP project, the main objective of the VSBK at Konkia (the second such in India) was to anchor the technology. In line with this objective, the project was to make assessments of factors for stable operation, fuel efficiency, and local resource mix to achieve quality. Another important project level objective was to collect additional relevant information leading to the consolidation of the VSBK technology package, and to learn about the appropriate scale where the VSBK technology becomes economically viable. By constructing and operating the VSBK at Konkia, Gram Vikas expected to validate the commercial viability of the technology, have a fully operational technical team in place, and create the basic in house know-how and capability for future replication of the VSBK.

Institutional arrangements for VSBK II

The initial contract between SDC and Gram Vikas was signed in 1997 to construct and operate a VSBK at a total budget of Rs 9,13,675. DA, which was instrumental in setting up the Datia unit, was to provide technical support for the initiative. According to the MOU between DA and Gram Vikas, Gram Vikas agreed to deploy a dedicated team for the VSBK operations. It was agreed that DA would help Gram Vikas put up a VSBK including

- Selecting a suitable site,
- Arrange visits of Chinese experts during construction and firing,
- Provide DA experts,
- Arrange energy audit of the kiln thorough TERI,
- Liaise with SDC regarding performance and status of the project,
- Supply of mechanical components to the kiln such as trolleys and unloading device, and
- Training the Gram Vikas staff between March and September 1997.

Gram Vikas's responsibilities included

- Identifying a coordinator,
- Arranging suitable site and land,
- Construction and operation of the kiln (arranging supply of green bricks
- moulded to specified standards and dimensions as per needs of the kiln),
- Arrange other consumables such as powdered coal,
- Employ firing and operation teams,
- Record performance data etc.

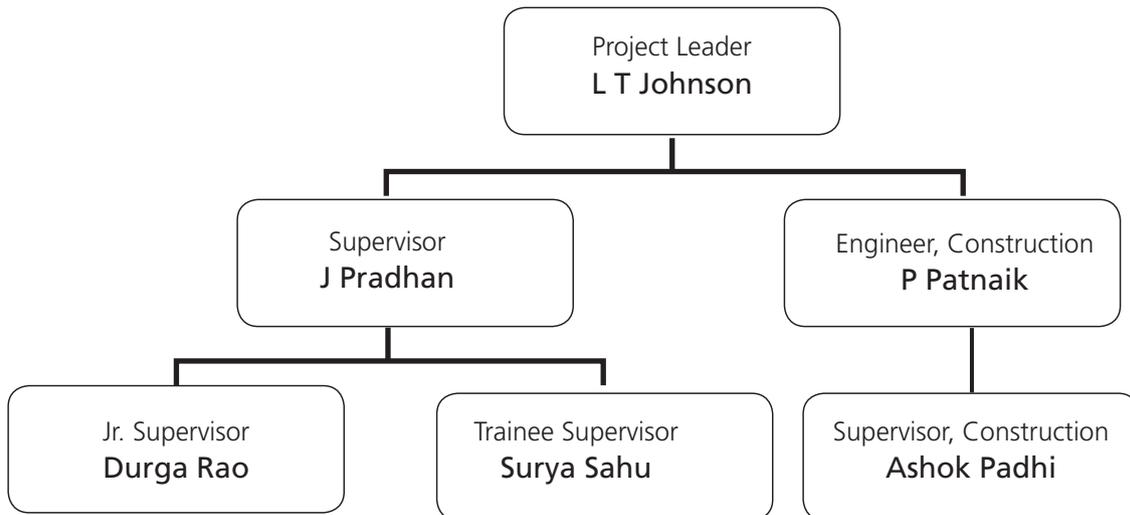
Operations at VSBK II

In April 1997, Gram Vikas started working on VSBK II at Konkia, 6 kms from the Gram Vikas campus. In line with Gram Vikas's objective of enhancing in-house capabilities with respect to the VSBK technology, it was felt that the maximum number of staff should be involved in the endeavour and hence, proximity to the campus was an important criterion for location.

The first team of 18 moulders (6 families) came from Patlampur in Ganjam district. They worked for 99 days and were paid Rs 170 per 1000 bricks. Subsequently, 16 families from Bilaspur in Madhya Pradesh were brought in. The firing team consisted of 16 firemen and 15 trainees, four of whom were from Asuramunda. On an average, Konkia had 4 people working in each of the three shifts, working under 3 supervisors, producing an average of 9

batches of bricks per day. The operational structure at Konkia is given in Figure 4.1. In all, over this entire period, a coordinator, 2 site engineers, 4 masons, 3 fire-masters and 12 firemen were trained. It took considerable time before the local tribals could be initiated into the process of working in shifts, a practice they were completely unfamiliar with. In addition, most of them were afraid to work with fire. The reluctance to work in the VSBK was further compounded by the fact that the initial batches of bricks produced were of poor quality. The primary reason for poor quality was that once operations started, it took the team some months to arrive at the optimal temperature (around 800oC) for the kiln. In the beginning, the temperature was much higher, in the range of 900oC, which was much too high and resulted in melted bricks.

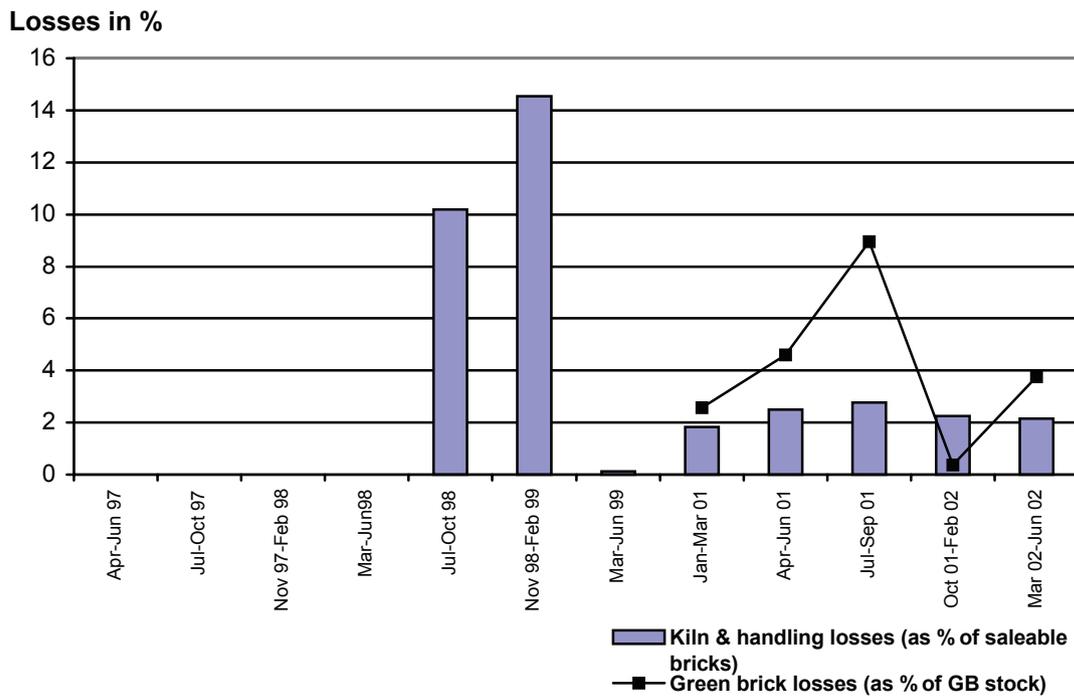
Figure 4.1 Project management structure at VSBK II



In May, one of the two shafts was fixed. The kiln was operated for two months, producing 75,000 bricks. The initial reports of Konkia were encouraging. By January 1999, the operations at VSBK II had been stabilized. There was disruption in operations for about two months in October-November 1999, on account of a super cyclone, when 52,000 green bricks were damaged. One of the shafts had to be repaired, and there were some other minor repairs

on the kiln. The project base office was entirely destroyed and had to be rebuilt. For this year, the total loss from moulding to marketing stage was 12%. One of the reasons for high losses was that a large number of green bricks had to be transported from Shantigram and the transportation losses were high. The proportion of bricks wastage in terms of kiln and handling losses as well as green bricks wastage is shown in figure 4.2.

Figure 4.2 Wastage level of VSBK II



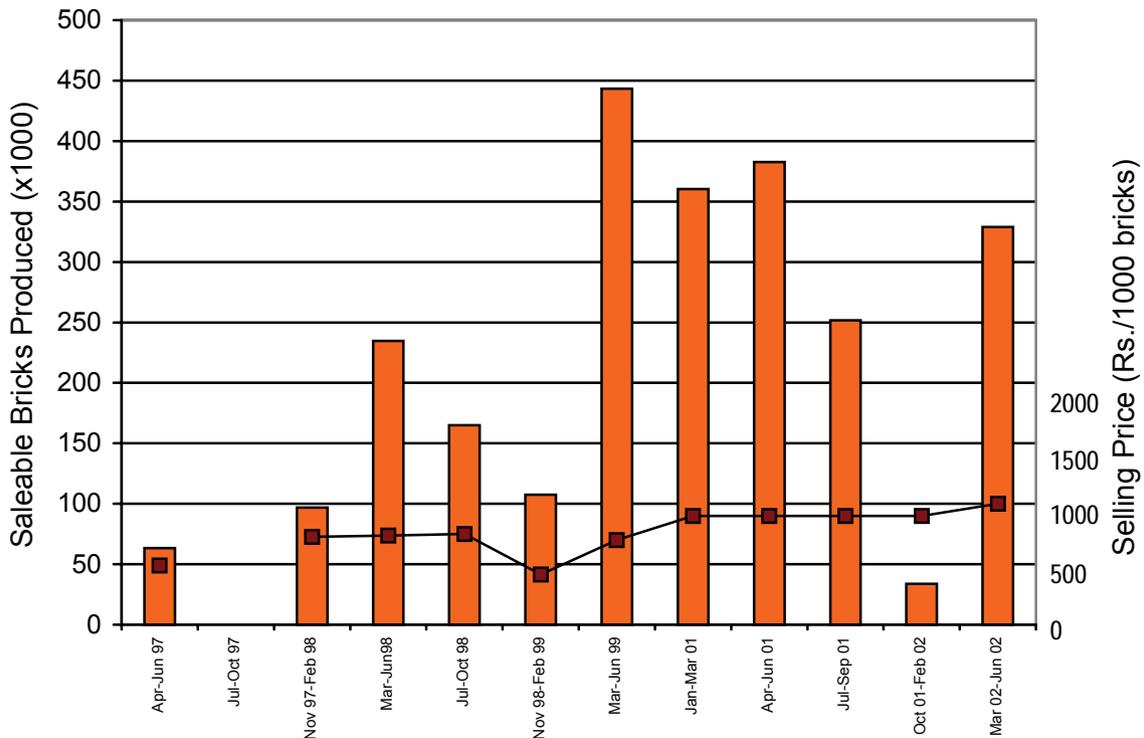
In 2001, the kiln ran for 8 months and produced 11 lakh bricks. The average over the years, was however 6,00,000. In 2002, 3,90,000 bricks have been produced so far (refer to figure 4.3).

The operations at Konkia were fraught with a series of problems, both natural and others. Some of the significant ones are as follows:

- Lack of appropriate facility for making and stacking green bricks for year round operation was a serious problem.
- The green bricks produced at the site were of poor quality (irregular shape and size), cracked and enhanced breakage percentage. Variation in their size and composition also resulted in higher breakages and non-uniform firing.
- Even though the kiln location was selected by experts (soil availability being one of the selection criteria), the stock of clay in the site was exhausted by December 1999. In 2000, green bricks had to be transported from a moulding site a kilometre away. This resulted in quality problems due to damages to the green bricks during loading, unloading and transport.
- Water-logging was a serious problem faced at the present site.

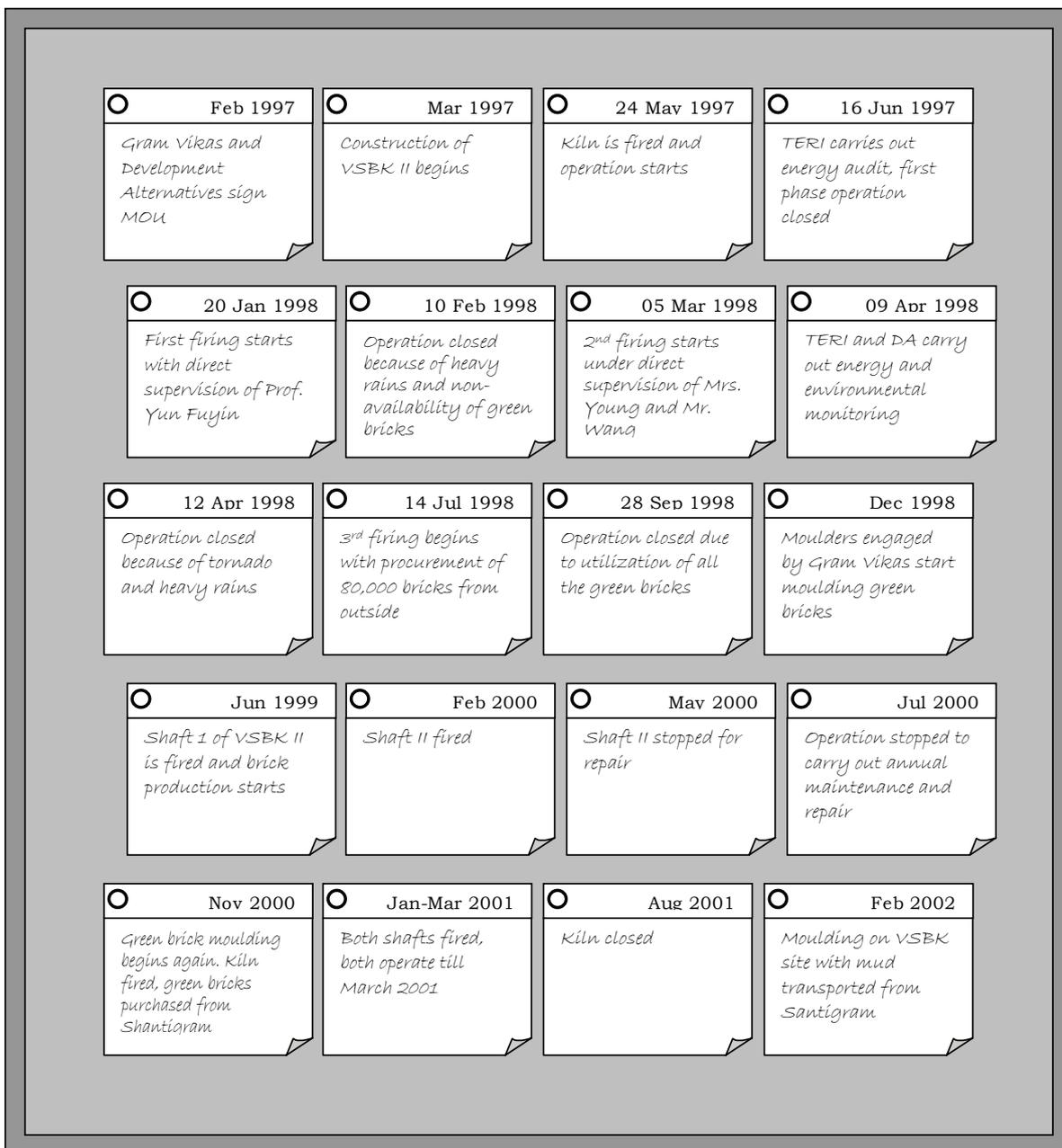
- The coal consumption was high due to wide gaps between irregularly shaped bricks.
- Several labour problems were experienced in Konkia, however none of them were out of the ordinary. Firstly, seasonal activities of moulding communities (agriculture, etc) caused disruptions in production schedules. Tribal people are never available for work during festivities. In Konkia, moulders come from as far as Bilaspur in Madhya Pradesh between the months of November and June. Recurrent malaria among the labourers and resultant absenteeism was another problem. At no time were the required 4 men available for the shifts. During the second year, 2 extra men were hired for each shift, by which time the problem of melted bricks was also resolved.
- Lack of protection from natural hazards, including heavy rains and extreme summers caused operational disruptions, including difficulties in storage of bricks.
- The day-to-day management of operations was difficult from the Gram Vikas headquarters at Mohuda, which is six kilometres away.

Figure 4.3 Brick production level and sale price at VSBK II



A diary of the important events in Konkia is given in figure 4.4.

Figure 4.4 Diary of events



Lessons from the Konkia experiment

As far as the technology anchoring objectives were concerned, the Konkia VSBK helped demonstrate the viability of the technology in local conditions. The only social action component in the VSBK II experiment was the training of moulders and the exposure of the community to the VSBK technology. Unfortunately, the kiln went through a number of vagaries of nature such as cyclones etc., because of which it had to be shut several times. The kiln also faced a problem because of the poor quality clay at the site. Later on, clay was brought in from another site, but this resulted in increased costs. However, at that time, achieving commercial viability was clearly not considered as one of the objectives of the experiment. In fact, the only parameter on which familiarity was gained was the operation of the kiln itself. Even within this, while many people learnt how to operate the kiln, not much attention was given towards incorporating the other wherewithal like material management, inventory control, labour management etc., which are equally necessary to optimize any production process.

The Konkia experiment essentially helped to establish that the technology is technically viable and usable. As a technology anchoring experiment, it was able to streamline the production process. Perhaps the most significant achievement in Konkia was that it helped build the capacities of a number of people/ traditional moulders. At the level of Gram Vikas, it exposed a number of its staff to the VSBK and brought in a certain degree of familiarity with and confidence in the technology, made possible primarily because of its proximity to the campus at Mohuda. Some of the achievements of the Konkia experiment are as follows:

- Several technical experiments like mixing of additives like NaCl/urea etc, ncreasing internal fuel etc. were carried out. The time taken for loading and unloading operations was reduced from 30-35 minutes to 15-20 minutes and from 20-25 minutes to 10-15 minutes, respectively.
- Breakage was reduced to 1.5-2% from 5.2-10.3% per 1000 bricks.
- The use of clamps for transporting and stacking hot bricks was introduced.
- Masons learnt to carry out repairs and regular maintenance.
- As only one shaft was operated most of the time, firemen had spare time and they learnt moulding. Their gradual upgradation in moulding enhanced the inhouse capacity of VSBK II, while it also generated a sense of stability and belongingness among the firemen.
- VSBK at Konkia has, from its inception, worked as a demonstration cum training centre – engaging moulder and other poor communities and training them in the operation of the kiln. The interest shown and the enquiries about the kiln from local entrepreneurs, district officials etc. has been fairly high.
- The VSBK II has been able to develop wasteland into agriculturally productive land. The location of VSBK II was on totally barren upland. By using up soil in production of bricks, the land has been brought to the same level as adjacent paddy fields. Given adequate supply of water, and some initial soil treatment, this soil is fit for cultivation.

While the operation of the Konkia kiln was fraught with a number of problems like adverse weather conditions, poor quality of clay, recurrent malaria among the workers etc, it yielded some important lessons that were not envisaged initially.

- Gram Vikas was exposed to a series of labour problems, which a production process is likely to encounter, given the prevalent social milieu and work culture. The kiln suffered from a recurrent problem of absenteeism among the workers, in particular those belonging to the tribal community.
- Gram Vikas was able to involve women in the various operations at the VSBK. It also experimented with engaging couples as fire team members, which reduced absenteeism significantly. The women trained in Konkia were able to handle all operations, except for unloading.

- Perhaps the most important lesson from the Konkia experiment was that it established clearly that while the physical process of brick production can be streamlined without much difficulty, building capacities in the area of marketing takes longer and a higher degree of handholding support.
- The experiment showed that for a moulder community, the transition from moulding to becoming managers of capital, is quite significant.

Future plans

In the four years that VSBK Konkia has existed and functioned, commercial viability and managerial efficiency have not been priority areas and the overall performance of the kiln has been sub-optimal. According to the Yearly Plan of Operations 2001- 02, the priorities for VSBK Konkia in the future will be to achieve operational efficiency in terms of stable operations for atleast 10 months, installation of an extruder and achieving a 50:50 proportion of hand moulded and extruded bricks, establishment of an extrusion shed and storage facilities to minimize loss of green bricks. The unit

would also strive to attain commercial viability to the extent of 75% of the costs and sale of 75% of total production with a minimum mark up of 15%.

It is also envisaged that VSBK II will evolve to be a training-cum demonstration centre, to enable the spread of the technology to a wider clientele, within and outside the realm of Gram Vikas. The training will focus primarily on moulder communities

and other poor communities. Effective linkages will be established with the DIC (District Industries Centre) for training and other support. For the next few years however, the training operations will have to be subsidized to the extent of covering

staff and overhead costs and part of operational expenses. Gram Vikas envisages that the VSBK in Bolangir area will have be supported for atleast seven years, till operations are stabilized. The only income will be from commercial sale of bricks. Local communities will be trained in management processes in this period, and it is hoped that the project will be commercially viable once operations are stabilized.

In this chapter...

✓ *Motivation for Asuramunda*

✓ *Objectives of Social Action Research*

5

The next step: Social Action Research

By the early months of 1999, Gram Vikas had firmed up its plans to expand its involvement in the VSBK project beyond the first kiln in Konkia. Once it was proven that the VSBK technology is viable and usable, Gram Vikas turned its attention to setting up a social action research process. The purpose of social action

research was essentially to check if traditional brick making communities could build, own and manage a VSBK and to prove that given the chance and proper managerial guidance, community efforts can result in beneficial economic upgradation. Gram Vikas firmly believes that poor rural communities (especially moulder communities) can be prepared, capacitated and trained to own and control the affairs of an appropriate technology application unit in the VSBK, provided there is a supportive environment and appropriate hand-holding during the initial gestation period. The proposed activity also ties up well with Gram Vikas's continuing objective of demystifying appropriate technology options to facilitate adaptation, use and management by poor and marginalized rural communities, to create sustainable livelihood opportunities and improving the quality of life of rural communities. Other considerations instrumental in Gram Vikas's decision to take up the Social Action Research component were as follows:

Market niche for the VSBK technology and government's commitment: Orissa has a good market for bricks and has been growing over the past few years. The market is especially vibrant

in the urban and semi-urban areas, where there is greater activity in infrastructure development and housing. Bulk of the existing production is through clamps and BTKs, which has its existing disadvantages. In the past few years, the Government of Orissa had banned operation of these kilns in the summer months, for their effect on the environment, affecting production (and supply) of bricks in the peak demand period. The district administration has expressed its keenness to support the setting up of VSBKs, which is being positioned as a viable alternative, in various parts of Ganjam district.

Lack of secure livelihood alternatives: Tribal youth in rural households are faced with limited livelihood options locally. Tribals continue to practise 'slash and burn' agriculture, which is entirely rainfed and has no assurance of yearlong food security. Alternative tribal livelihood options are based on collection and processing of forest produce, which has suffered due to indiscriminate exploitation of forests and government restrictions on the use of forests and forest produce. Attempting to break free from a life of deprivation, tribal youth are easily lured away by preying contractors to distant areas (Gujarat and Punjab are common destinations) to serve as unskilled labour. The living conditions at these places are miserable, and the earnings meagre.

Lack of job opportunities for traditional brick moulders: There are a largenumber of green brick moulders in Gram Vikas' project areas, especially concentrated in Boudh, Bolangir and adjoining

districts. These traditional brickmakers live in abject poverty, their skills totally under-utilized. They migrate with their entire families for nearly eight months in the year (October to June) subsisting as wage labourers by selling their physical labour at kiln sites. The living conditions at these sites are miserable and the children have no access to education or even a good environment to grow up in. When they return to their villages, they work as agricultural labourers, having no land of their own. These brick-makers feel no sense of belonging for their village and have no pride in being owners of skill. The VSBK technology has the scope to be a tool for poverty alleviation, especially in western Orissa (Bolangir/ Boudh), which has a large number of brick moulders,

Building on Gram Vikas's existing capacities: Gram Vikas's confidence regarding handling the VSBK technology stemmed from the team's technical and management capacities in operating the VSBK II at Konkia. This was to be the core team for training entrepreneurs and local brick moulding communities. Specifically, the following skills were developed:

- Trained masons and fire-team,
- Experienced supervisory staff including engineers to maintain and operate kiln,
- Capable and trained women fire-team,
- Experience of operation throughout the year, and
- Fire-team members trained in brick moulding and quality standards and checks.
- The confidence that communities can own and manage resources and assets came from Gram Vikas' experience in the Rural Health and Environment Programme (RHEP), which is the organization's flagship programme today. Gram Vikas had strong contacts in the field level with local communities through the RHEP. The built-in unity among RHEP beneficiaries, and strong united women's groups in these villages was to serve as the basis for the VSBK initiative. The RHEP in the villages where the VSBK is proposed has already demonstrated effective mobilization of local resources as well as creation of community assets based on development of local resources (forests/ ponds/ livestock).

RHEP- A new paradigm in community initiative

RHEP is an integrated development package that focuses around a people-centric process aimed at the total village population, without any exclusion. Using water and sanitation as the prime moving force, the programme brings into focus the other basic problems in the village. The provision of infrastructure for water supply and individual toilets and bathing rooms being the short-term goal, the programme mobilizes the community to initially build community assets in the form of a water tank, which then lead to individual gains in the form of water supply to each house. The RHEP villages showcase a process of total development, resulting in empowerment of women, secure livelihoods, regeneration of natural resources such as ponds and forests, improved health status and nutrition levels. A significant point of departure from traditional developmental efforts is that in RHEP, funds from external sources are used only as seed capital, additional funds being generated locally from the government and the community. The community contributions range between 45- 50% of the total investment

Objective of the Social Action Research component

In line with the above thinking, the following objectives were set for the experiment:

Immediate objectives

- To test the validity of the technology as a tool for poverty alleviation and employment generation, owned and managed by poor rural communities.
- To generate awareness of the technology, train the target groups in operations and management of VSBK, and establish linkages with financial institutions.

Short-term objectives (4 to 6 years)

- To establish the commercial viability of VSBK units managed by communities of brick moulders and other poor sections.

- To increase the acceptance of this technology among development planners, bankers and financial institutions.
- Illness and frequent turnover of trained workers in the kiln

Risk Analysis

Before going in for the Action Research component, Gram Vikas realized that there were definite risks involved in any such experiment. However, Gram Vikas's growth trajectory shows clearly that there have been many instances of such risk taking in the past (exemplified in biogas promotion, Rural Health and environment Programme, and many others) and that such risks are an integral part of organizational development. Its experience also showed that given appropriate handholding and capacity building, there is a high percentage of success in such efforts. Some of the risks faced in the endeavour are as follows:

- Competitive market fluctuations resulting in low demand and returns (profits) from the activity resulting in disillusionment
- Unpredictable weather conditions affecting work plans and schedules
- Usurpation of the management and control by unscrupulous/ exploitative elements, vested interest groups (or individuals) of the village
- Difficulty in sustaining the interest of the moulder communities in the long term benefits from the activity
- Difficulty in ingraining the self-employment mentality among the stakeholders, and the capacity to manage the enterprise independently in the long run

6

Asuramunda : The initial steps

In line with its plans to embark upon the social action research component of the IBP, Gram Vikas set to selecting a village where a community owned enterprise could be set up around a VSBK. The criteria for selecting a village included a homogenous community, a significant yet manageable moulder community size, and availability of land for the VSBK. With the intent of minimizing potential risks and thereby maximizing chances of success, it further restricted its search to only those villages where Gram Vikas had some prior experience with the community. The first inquiries were around a village called Souripalli in Boudh District. Souripalli was a village covered under RHEP and Gram Vikas had worked with Souripalli for more than 8 years. Souripalli had a significant moulder population and the quality of bricks was better than kiln burnt bricks (which had been used for RHEP). However, after a few visits and discussions with the villagers, it became clear that the project might not take off in the village. There was too much of a disparity between the 15 brick maker (dalit) families and the remaining 35 general caste families. Of these 35, at least five families were better off with family members earning regular salary incomes. They could not find a common ground to share the costs and benefits of an economic enterprise. In addition, the land identified by the people for the VSBK could not be legally obtained. Gram Vikas also ran into a discord with the Souripalli villagers over the issue of loan repayment for a housing project.

In this chapter...

- ✓ *Village selection*
- ✓ *Choice of Asuramunda*
- ✓ *Community mobilization*
- ✓ *Setting up management systems*
- ✓ *Construction of VSBK*

The choice of Asuramunda

Subsequently, Souripalli was dropped and Asuramunda in Bolangir district was the next village that came up for consideration. District Bolangir, which has the largest concentration of green brick moulders in India, has a good skill base in green brick moulding. Gram Vikas had been in contact with Asuramunda since 1998, when it had implemented the Rural Health and Environment Programme in the village. In Asuramunda, RHEP was initiated in January 1999 and the first phase - construction of toilets and bathing room for all families and village water supply system - was completed by July 2000. Asuramunda created a corpus of Rs 50,000, 25,000 in cash and the rest in the form of material, averaging to about Rs 1000 per family. Gram Vikas found that many of the obstacles found in Souripalli were not there in Asuramunda. To begin with, all 50 families in the village were more or less of similar economic condition. Only one person in the village had any sizeable land holding. Though he had good control over the affairs of the village - he was replaced on corruption charges (but re-elected as the President of the Village Development Society), his influence counter-balanced by a strong youth group. This group of about 20 young men had established their credentials through the services they extended during the RHEP implementation.

Some of the important factors that were considered as opportunities in Asuramunda are as follows:

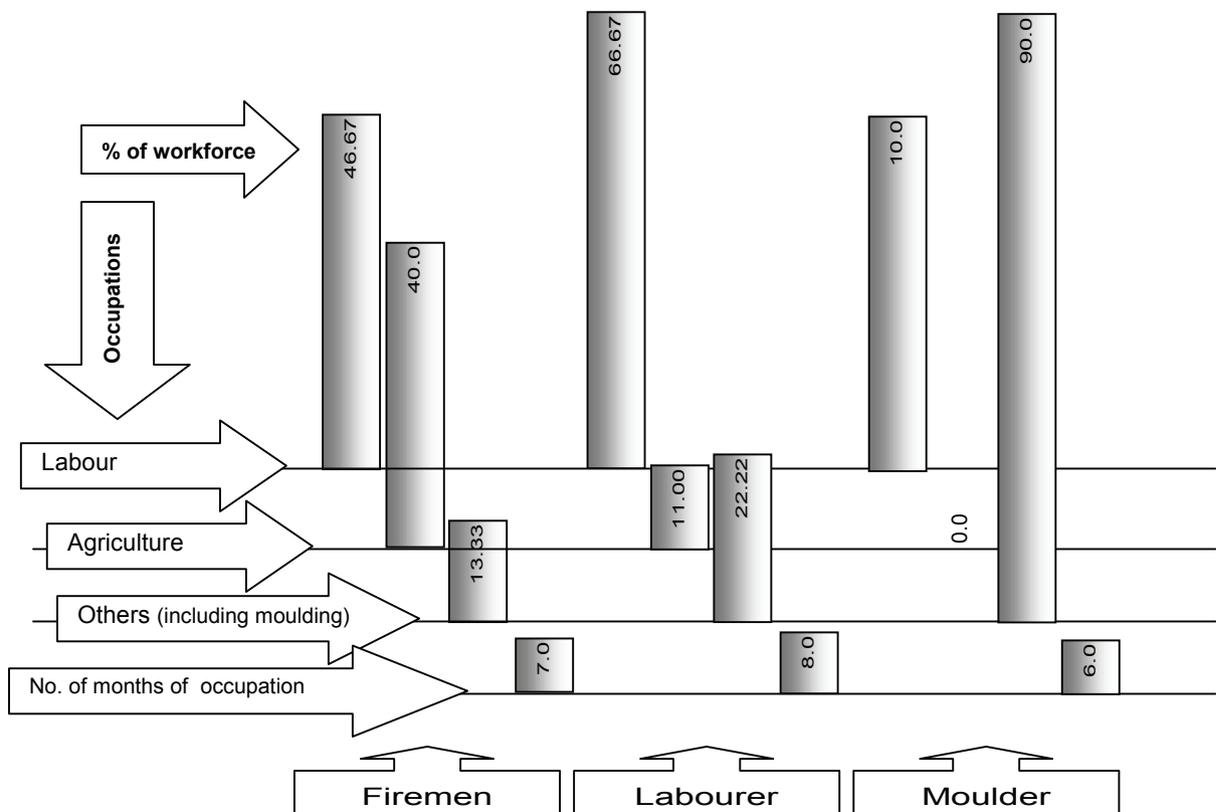
- There are no BTK or other kilns within a radius of 5 kms.
- Most families are dependent on seasonal wage employment and migration to distant places, for whom employment alternatives are an immediate necessity.
- There are no salaried people in the village.
- Ongoing construction in surrounding villages provides a potential and immediate market for the bricks.
- There is an abundant supply of raw material of desired quality at site-soil sample test showed good colour, ring and appropriate shrinkage limits.

out of which 15 belong to scheduled castes, 5 to scheduled tribes, and the rest to general categories. 45 families fall in the below-poverty-line category. Ten of these families are moulders. Most people depend on agriculture and agricultural labour for their livelihood. For 34 families, agricultural labour is the primary occupation, while 7 are in business, four in service and 5 are artisans. Most families work in the village itself, except for nine moulder families who cultivate during the monsoons and leave for other districts like Ganjam, Cuttack, Jagatsinghpur and Bhubaneswar on brick making contracts for about 6 months from December to May. Data collected as part of the primary survey conducted for this study showed that a large number of the VSBK workforce depend on wage labour (refer to Figure 6.1). The data also showed that the maximum length for which some occupation is available in a year is around six months.

The profile of Asuramunda

Village Asuramunda falls in Agalpur block of Bolangir district, around 43 kms from the district headquarters. It has a total of 50 households

Figure 6.1 Occupation pattern in Asuramunda



The moulder families who migrate seasonally are paid an advance of Rs. 2000- 3000 before their services are hired. The prevailing rates for moulding varies from Rs. 90 to Rs.130 per 1000 bricks moulded plus additional facilities like fuelwood, kerosene for lighting, shelter facilities, and medical aid in case of illness at the site. These moulders mould about 800 to 1100 bricks per day. The moulder families are contacted by middlemen in the locality who secure them contracts for moulding in other districts. Under the present arrangements, the moulder families have to leave their villages for about six months in a year. The living conditions at the work site is also not suitable as they have to stay under temporary shelters in the winter months and they often fall ill in such conditions.

It is important to note here that even though the community owned enterprise proposed at Asuramunda was viewed as a natural progression from the technical action research phase at Konkia, it was not entirely the case. There were several parameters in Asuramunda, which were new and had to be addressed afresh:

- The VSBK brick was a new technology, as far as the Asuramunda community was concerned. Apart from a brief visit to Konkia by a few people, their prior 'interaction' with the technology was nil.
- From a commercial angle, the VSBK brick was a new product for the local market.
- For the village community as well as Gram Vikas, the concept of a community owned business enterprise was an entirely new and an untested one.
- Apart from the novelty of the initiative itself, ideas like share capital, factory like shift-operations, marketing etc. were all new to the village community.

Community mobilization phase

During the year 2000, Gram Vikas started initial discussions with the villagers on the VSBK idea. Five of the villagers (including the President) visited Konkia in August 2000 to understand the working of the kiln. The Project Co-ordinator of Gram Vikas in Bolangir (who was responsible for RHEP

implementation in the village and had established strong rapport with every one there) conducted 3-4 meetings during this period. He explained the terms and conditions that would govern Gram Vikas's involvement in such a venture.

The expectation of the villagers from VSBK Asuramunda was that there would be gainful employment for the youth in the village who would be trained as members of the fire team and also enhanced income for every member family. The moulders looked forward to living in their own village and working, which would enable them to take care of their family members and landed property better. The moulders expected a rate of about 100 to 120 per 1000 bricks, even though they were willing to settle for slightly lower wages if the arrangement permitted them to stay in their own village and not migrate. There was also a feeling among the villagers that it was Gram Vikas that was taking the real risk. The villagers' investment, as compared to that of Gram Vikas, was very small, and so was their share of the risk. Further, from their experience with Gram Vikas during the implementation of RHEP, the villagers were assured of transparency in operations, especially those involving financial transactions.

Terms and conditions put forth by Gram Vikas

- The kiln will have to be owned by the villagers.
- Each and every family will contribute his/her share of labour, materials and cash to the project. The quantum and nature of such contribution was to be determined later.
- Gram Vikas will provide the finances required for the construction as a loan. This money is to be repaid with interest to Gram Vikas. (Though the support for this unit was a grant from SDC, Gram Vikas converted this into a loan at final delivery. The money when repaid will be returned to the village to create a development fund).
- The village will form a committee that will manage the construction and operation of the unit.
- The villagers will settle all internal conflicts themselves. Gram Vikas reserves the right to withdraw from the project in the event of an unresolved conflict among the villagers.

After a series of discussions and a few people from Asuramunda visiting Konkia, the community agreed to go in for a VSBK in their village. In one of the initial meetings, the President and the Secretary of the VSBK Committee signed an agreement drawn up between Asuramunda and Gram Vikas (Refer to Annexure 1). The agreement stipulated that 100% of the amount was to be treated as a loan to be repaid within a period of 3 years, an interest of 12% per annum would be charged on the loan. Once the loan is repaid in full, the ownership of the VSBK unit will be transferred to the village community. As far as village contribution is concerned, the villagers agreed to provide free labour for construction. Gram Vikas also agreed to purchase 35,000 of the required 70,000 bricks from Asuramunda itself at the prevailing market rate. Having earlier supplied bricks for the RHEP, the villagers viewed this as an additional, albeit one time, source of income. In April-May 2001, 3 persons, selected by the villagers, were sent to Konkia for a 3-month training.

Setting up management systems

One of the first tasks undertaken in Asuramunda was the formation of the VSBK Committee. At the time discussions for the VSBK were going on, the RHEP Committee was already functional in the village. However, as the RHEP secretary had considerable amount of work, it was decided to appoint a new secretary for VSBK, who would be solely responsible for the VSBK functioning. Further, many people had started losing faith in the president of the RHEP committee and were looking for new leadership for the VSBK. At that time, a DFID supported Watershed programme was also being planned in the village, for which yet another committee was planned. However, the villagers felt that there simply were not enough people for so many committees and set up a common committee for all the developmental activities in the village, called the Gram Unnayan Samiti, Asuramunda. However, even though there is a single committee, there are two sets of byelaws, one for the RHEP operations, and another one for the VSBK. It was decided that the new committee would have 50% women.

Once the VSBK started functioning, the VSBK committee formed to oversee construction of the kiln had to be disbanded as most of the committee members wanted to work in the kiln. Gram Vikas had insisted that those who were paid by the kiln for their services could not also carry out management control. Hence a new committee was formed, this time consisting of elder villagers. Currently, the VSBK committee has a total of 8 members out of which 3 are moulders. Women participate primarily in the important meetings. The decision making is divided between the general body, which is responsible for all strategic decisions that affect the village as a whole, and the VSBK Executive Committee stepping in for decisions that are time bound and need to be taken urgently. Major decisions made in the VSBK experiment so far are documented in Annexure 2. The committee is registered under the Societies Act, and maintains proper books of accounts, which are audited by Gram Vikas Bolangir Project Office on an annual basis¹

Construction of VSBK

Once the villagers resolved to agree to these conditions, the process of building the VSBK was flagged off. Soil samples from the VSBK-Asuramunda site were collected and tested by the site engineer. The test report indicated that the quality was good and that there was sufficient soil to support operations for atleast 5 years. The summary of the results is as follows:

- Colour: Deep Red
- Ring: Good
- Shrinkage 4-6%

The technical team in Gram Vikas worked with experts from IBP partners to develop the design of the kiln. Partners also visited the village and the proposed site to understand the technical feasibility. Gram Vikas prepared a feasibility study that analyzed technical and financial parameters of the kiln. The configuration of VSBK was decided on the projected estimates of brick sales in the region. It was estimated that about 2.5 to 3 lakh bricks

¹ The RHEP committee was registered with the objective of empowering these committees so that they can function as small NGO and implement RHEP in other areas. In fact, the Asuramunda RHEP committee women were instrumental in motivating two other villages, Tentuligaon and Kantapalli, to take up RHEP, which were taken up in the interim phase of RHEP (2002-03).

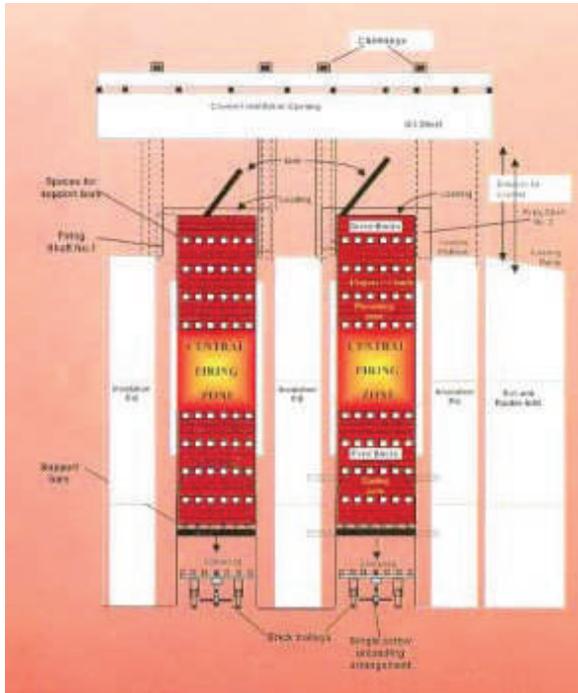


Figure 6.2 Design Details of VSBK

could be sold per month. Working backwards, the technological configuration of the kiln was decided upon. Figure 5.2 shows the design details of the VSBK.

After the first meeting on November 15, 2000, the work on cleaning the site, designing the layout etc. commenced on Jan 11, 2001. Even though the villagers were very enthusiastic to start construction, the progress was somewhat halting. Firstly, soon after the construction process started, the shaft wall was constructed up to 4 ft height and demolished twice by the Gram Vikas engineer. Receiving no clear explanations on why this was being done, the villagers who had been contributing labour actively, protested and demanded a meeting with senior Gram Vikas staff. The third time this happened, the villagers refused to contribute free labour any more and Gram Vikas had to agree to pay a wage of Rs 25 per day to all the villagers who

participated in the VSBK construction.

Subsequently, the construction proceeded smoothly for some time. However, once construction was completed up to the shaft level, a huge crack appeared in one of the shaft walls. The villagers got alarmed and called for the Gram Vikas project staff at Bolangir. However, by the time Gram Vikas staff arrived, a sidewall of one of the three shafts collapsed completely. This incident took a serious toll on the confidence level of the villagers and they decided to back out of the experiment. It took Gram Vikas considerable amount of convincing before they agreed to join in again². Originally conceived to be a three-shaft kiln, the design had to be altered after the third shaft collapsed due to poor workmanship and unprecedented heavy monsoon rains. As a result, contrary to expectations that the construction process would be completed by April, the VSBK was completed only by September 2001. It was estimated that the capital cost of the Asuramunda would be in the range of Rs. 5,88,402 , against which Rs 6,22,071 were spent (refer to Annexure 3 for complete costing details).

Technical configuration of VSBK-Asuramunda

Kiln Dimensions :	Width: 4.676m
	Length: 8.838 m
	Height: 12.330 m
No. of shafts :	2
Shaft Dimensions :	1 m x 1.75 m
Shaft height :	12 batches
Drying :	Sun drying
Moulding :	Hand Moulding only

The Asuramunda VSBK was fired on November 1, 2001. The kiln was formally inaugurated by the District Collector of Bolangir on November 6, 2001. Firing began on November 22 in one shaft. During the first month of operation, the villagers sold 2000 bricks in the open market..

² Eventually, Gram Vikas instituted an enquiry into the incident, which revealed that at the time of construction, the routine mud-packing of the shaft was not done properly. Because of this, as the shaft walls rose, the downward pressure caused the shaft wall to collapse.

In this chapter..

- ✓ *Management of operations*
- ✓ *Work Force*
- ✓ *Management of IBP*
- ✓ *Operations in first year*
- ✓ *GV's involvement in VSBK*
- ✓ *Future directions*

7

The Asuramunda VSBK experience

The VSBK operations in Asuramunda can be divided into three distinct activities: moulding of green bricks, transportation of green and red bricks, and the kiln operation (refer to figure 7.1). Each of these activities has its own specific requirement in terms of skill level and labour. For details on the operation of the VSBK, refer to Annexure 4.

Management of operations

In the present arrangement, the kiln operations are managed by an operations team, consisting of five Supervisors, the firing team, transporters and green brick moulders. There is also the VSBK committee, which does not participate in the day-

to-day functioning of the kiln, but is responsible for strategic decisions. Gram Vikas has placed a Site Supervisor to support the villagers in running the kiln. At the moment, technical controls are with the Gram Vikas person, but material and financial controls have been handed over to the concerned village Supervisors. Two nominees from the VSBK committee and the Gram Vikas Project Co-ordinator operate the bank account of the project.

Figure 7.2 shows the management structure for the VSBK and the roles of each of the stakeholders in the same.

Figure 7.1 Activity chart of VSBK operations

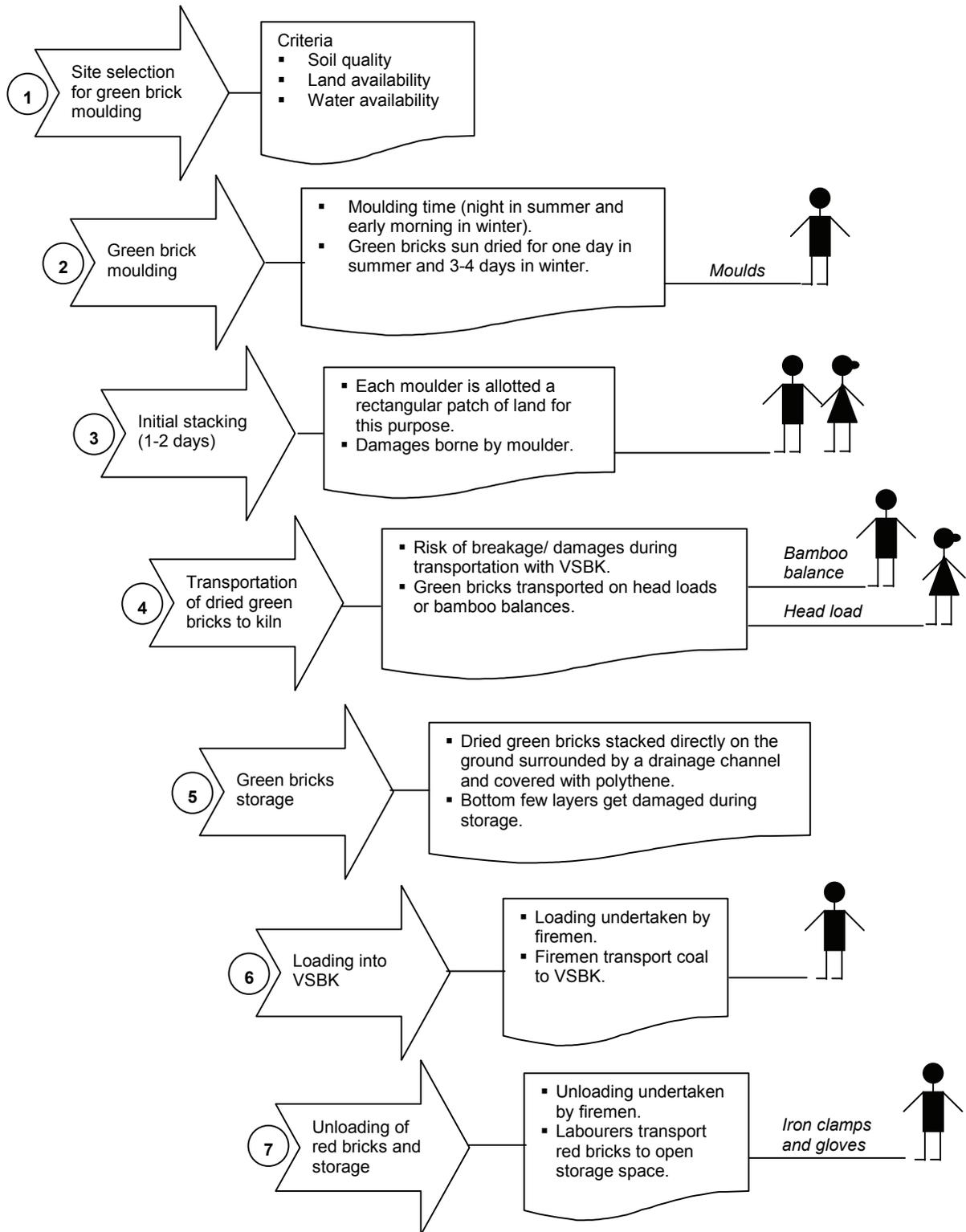
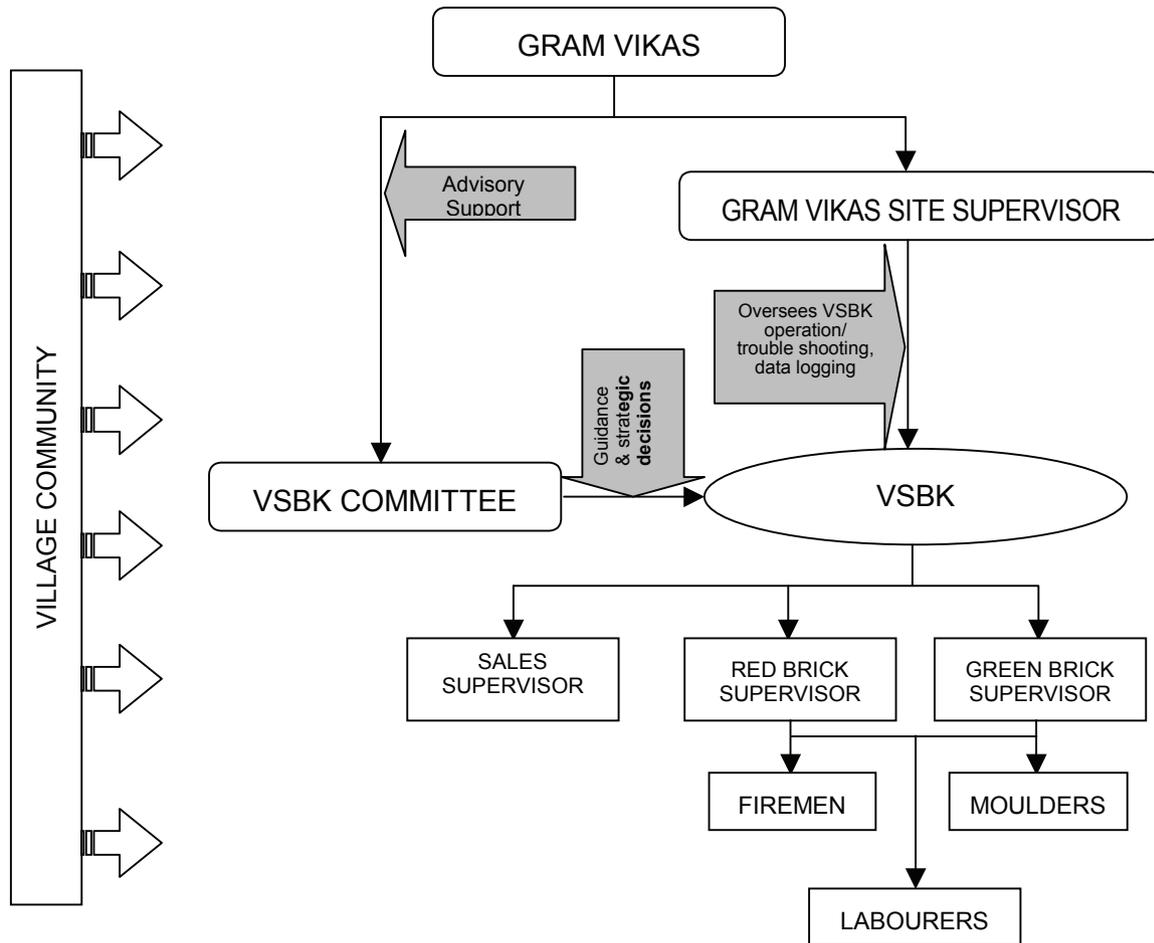


Figure 7.2 Management structure of VSBK



Work force at VSBK: Initially, it was envisaged that the VSBK would employ around 17 workmen (Fire Team) and 2 Supervisors. It is estimated that the kiln would be operational for about 250 day per year and the members of the fire team would be employed for the entire duration. It was also expected that 15 moulder families would be required per year, who would be employed for about 180 workdays.

Identification of workers: The villagers identified persons to take up different functions in the kiln. To begin with, all the interested persons applied, out of whom 21 were short-listed. Preference was given to younger people, in 18-25 age group (the age limit was later increased to 35 years). 18 persons were finally selected to operate the kiln, for transportation, loading and unloading. Five of the educated youth

were appointed as Supervisors - one for green brick production, two for kiln operations, one each for sales and accounts. The moulders were selected by the villagers themselves. The families were given the choice between moulding and having one person work in the kiln. Some 14 families chose moulding, the others opted to send their sons or daughters to work in the kiln. Of the 14 who chose moulding, some found employment in other works in the area and finally did not turn up for moulding. Eleven of these Families used to migrate every year during the moulding season.

The VSBK employs three categories of workforce:

Green brick moulders: The moulders are allotted space adjacent to the VSBK, where they mould green bricks. The site being close to the village, the Asuramunda moulders stay in the village and come to mould bricks on a daily basis, those from outside however have erected temporary shacks on the site itself where they stay with their families and mould green bricks during the season. As of now, there are 11 moulders (five from Bakti, a nearby village) moulding green bricks for the VSBK. Out of these, 9 are traditional moulder families, the rest have moved into the business.

Fire team: The kiln operations are managed by the fire team, consisting of Firing Supervisors and firemen. The Fire Team has 5 Supervisors- 3 Firing Supervisors, one for each shift, one for Sales and one for Green Bricks. The fire team operates in 3 shifts of 8 hours each. A team of 7 firemen, totalling to 21 firemen, mans each shift. In 24 hours, 9 batches of 280 bricks per shaft can be fired. There is also an additional pool of firemen, who are employed on an ad hoc basis as and when required. Gram Vikas has fixed the salaries of the Supervisors in consultation with the villagers. Initially Rs 950 was decided upon, with the understanding that once the profits increase, the salaries will be increased.

Transportation labour: Transportation of greenbricks is carried out by casual labour. Typically, women carry out this task carrying 9 bricks at a time on their heads. It is considered socially unacceptable for men to carry loads on their heads. In case there is a shortage of women for some reason, men prefer to carry the bricks on long bamboo balances, slung over their shoulders, carrying 16 bricks at a time. As of now, there are 21 transportation staff. The payment for transport

Gram Vikas's policies on the VSBK management

- **Benefits:** The members of the VSBK would be paid annual dividends depending on the profits made. There is also provision for additional dividends to the brick moulders on the basis of volume of bricks produced.
- **On Advances to hand moulders:** The moulders would be paid on a weekly basis and no advances would be paid to them.
- **Gender Wage parity:** There would be no disparity in wages based on gender.
- **Child Labour:** No child under the age of 16 yrs of age would be allowed to work at the kiln in any capacity.
- **Working conditions at the site:** Suitable provisions have been planned at the worksite to ensure proper and safe working conditions. There is a provision for a work-shed, a creche, adequate lighting arrangements at the kiln, safety equipment (Goggles, gloves and other accessories) for the fire team, drinking water facility etc.

of bricks is done on a contract basis, between the Committee and a group of villagers. Around 5 persons are involved on average during a day in this task. The agreement is to pay Rs.40 per 1000 bricks transported from the moulding site to the stack and Rs.40 per 1000 bricks transported from the stack to the loading platform.

Specific responsibilities as well as the remuneration for the working staff of the VSBK are given in table 7.1.

Table 7.1 Responsibility chart of the VSBK workforce

Worker category	Responsibilities	Remuneration
Firemen	<ul style="list-style-type: none"> ♦ Loading, unloading, and stacking of bricks ♦ Breaking coal into small pieces ♦ Cleaning of the VSBK premises ♦ In case of a transportation problem, they even transport green bricks from the green bricks site to the kiln. 	Rs. 30 per day
Firing Supervisor	<ul style="list-style-type: none"> ♦ Ensuring that atleast 4 firemen are present for each shift ♦ Scheduling the timetable for the firemen ♦ Maintenance of registers ♦ Ensuring that there are adequate bricks for the running shift and the next one ♦ Ensuring that firemen follow safety regulations like wearing helmets, especially while unloading. 	Rs. 950 per month ¹
Green Bricks Supervisor	<ul style="list-style-type: none"> ♦ Overall responsibility for quality of green bricks (shape, size etc.) Attendance of moulders ♦ Supply of water and electricity for the moulders² ♦ Supply of raw material to the moulders ♦ In case of rains, he is also responsible for the protection of the green bricks ♦ Making weekly payments to the moulders 	Rs. 950 per month
Sales Supervisor	<ul style="list-style-type: none"> ♦ Counting of red bricks and recording the damage ♦ Purchase of coal ♦ Advertising and selling bricks ♦ Cash collection 	Rs. 950 per month
Moulder	<ul style="list-style-type: none"> ♦ Moulding green bricks 	Rs. 130 per 1000 bricks ³
Transporting labour	<ul style="list-style-type: none"> ♦ Transporting green bricks to the kiln ♦ Transporting red bricks from the kiln to the storage space 	Rs. 40 per 1000 bricks

Management of the IBP within Gram Vikas

The Asuramunda VSBK project is looked after by Gram Vikas's Bolangir Project Office. Gram Vikas has 8 supervisors in Bolangir district, who work in around 20 villages. Supervisors are based in RHEP villages. The Bolangir Project Office is closely involved with Asuramunda (refer to Figure 7.3 for the programme management structure of VSBK). Even though the only dedicated staff for

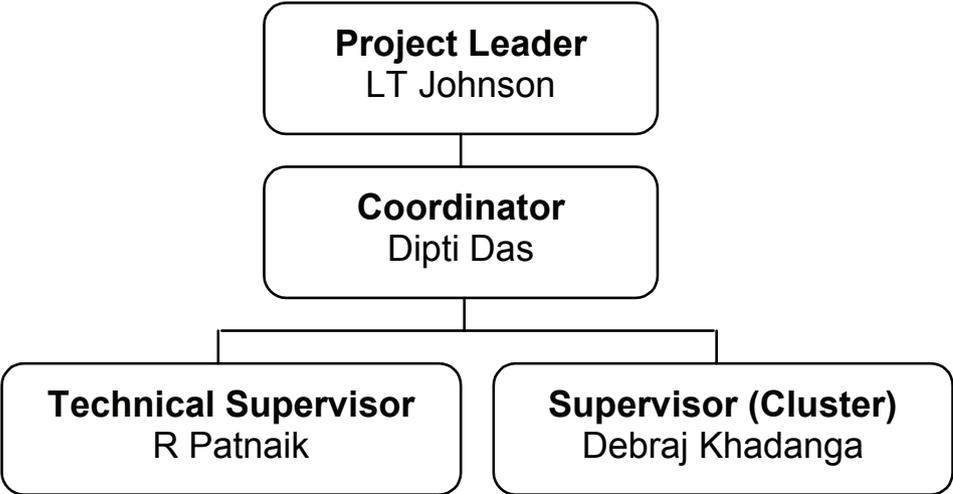
the VSBK is the Site Supervisor, who is stationed in Asuramunda, the RHEP staff, including the RHEP Supervisor and the Programme Coordinator, is closely involved with the project. The office carries out annual audits for the VSBK project, which is a statutory requirement for any society registered under the Societies Act. The roles and responsibilities of Gram Vikas staff with respect to

¹ The supervisors' salaries are linked to attendance, in case he is absent for a few days, his salary is deducted

² Most moulders prefer to work at night when it is cooler. Hence lighting is essential.

³ A trained moulder is able to produce around 1000 bricks a day, new ones produce 300-400 green bricks per day.

Figure 7.3 Programme Management Structure



Asuramunda are outlined in figure 7.4.

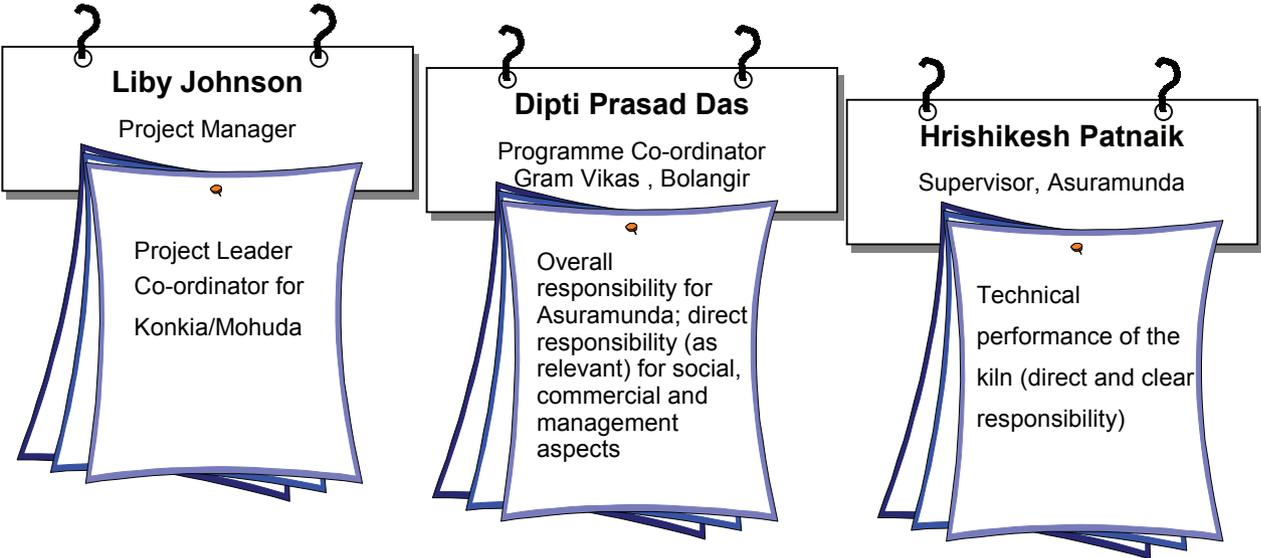


Figure 7.4 Roles and responsibilities within Gram Vikas

Operations in the first year

For the first two and a half months only one shaft was operated, after which both shafts were made operational. In February 2002, moulding of green bricks was initiated. 9 moulder families from the village were involved in moulding, who moulded and stacked 1,95,000 green bricks. The kiln functioned from November 23, 2001 to May 20, 2002 with about twenty days of stoppage in between due to heavy rain affecting green brick production. 35,000 green bricks were damaged at the moulding site itself, 3153 during the transportation from moulding site to stacking. Once the bricks were stacked, another 24,250 bricks got damaged and almost 30,000 of the lowermost layer of bricks were damaged in the rains. In May 2002, the kiln was closed down for the season as there weren't enough green bricks stock to ensure running for a long period. Another reason for the kiln closing down was that there was a severe shortage of labour for transporting of bricks. There were also regular rains during that period, which made it impossible for the moulding operations to

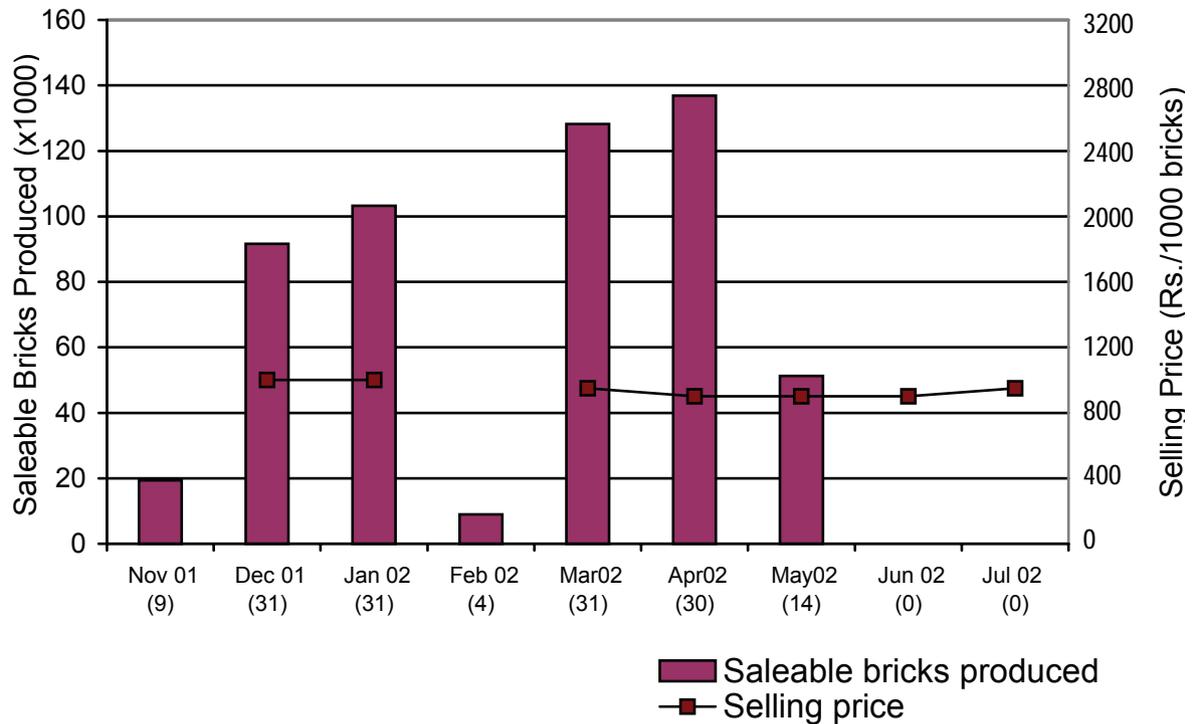
continue. Since May, there have been further damages and presently available stock is about 20,000 green bricks. As of August 2002, a total of 3,65,000 bricks had been sold, out of which 100,000 were for use under various Gram Vikas projects, 60,000 were sold to the block office and

2,00,000 to other parties. During the six months of operation, the sale price of the VSBK bricks fluctuated between Rs. 900 to 1100 per 1000 bricks, averaging around Rs. 950 (refer to figure 7.5).

Gram Vikas's involvement in the VSBK

Gram Vikas has been quite clear on the kind of involvement that it has with the Asuramunda community. It firmly believes that the villagers should do everything themselves, even if it means short-term compromises, in terms of higher cost of production, lower quality of bricks, larger stock of unsold bricks etc. However, while playing the role of an observer, the Bolangir project office is ready to step in to resolve or avoid a serious crisis. However the stepping-in only happens if the villagers specifically ask for it. The line between allowing the VSBK committee to perform and learn on its own and Gram Vikas stepping in to address day-to-day crisis is very delicate. Over time, Gram Vikas's involvement has been coming down and the villagers are beginning to take major decisions on their own. During the construction and early operations phases, the interaction was more intensive, with the Head Office staff visiting Asuramunda almost every month. This has now come down to approximately once a quarter. Table 7.2 documents the key decisions taken in various village level meeting so far, and the involvement of various stakeholders, viz. Gram Vikas, village community, VSBK committee, in each.

Figure 7.5 Brick production level and sale price at VSBK, Asuramunda



Since the VSBK started functioning in a streamlined manner, there have been two major occasions, when Gram Vikas has had to make a decisive intervention. In the first occasion, when a large number of bricks got washed away in rains in February 2002, Gram Vikas staff had to reach the village and take corrective action. Gram Vikas was also called many times when the moulders did not get their weekly payments on time. Earlier Gram Vikas used to make all payments directly to the workers. For Gram Vikas to release funds,

the respective Supervisors are required to send in details on number of green bricks moulded, attendance etc to Gram Vikas on a monthly basis. In March 2002, once revenues started coming in, this system was terminated. Since Gram Vikas stopped paying salaries, their involvement in the operations came down significantly. Now this is managed entirely by the villagers, who sometimes bring the cashbooks to the Bolangir office for auditing. In future, Gram Vikas plans to restrict its involvement only to periodic and annual audits.

Table 7.2 Key decisions taken in Asuramunda village meetings

Date of meeting	Major decision taken, issues discussed	Decision taken by		
Nov 15, 2000	Terms of Gram Vikas loan, share capital and profit sharing mechanism	✓	✓	
Nov 22, 2000	Formation of VSBK Committee	✓	✓	
Dec 28, 2000	Villagers to supply bricks for the VSBK construction			✓
Jan 31, 2001	Identification of persons for VSBK construction		✓	
Feb 20, 2001	Identification of persons for firemen training at Konkia		✓	
Mar 12, 2001	Instituting norms (fine of Rs.50) for defaulting workers	✓	✓	
Mar 26, 2001	Village Development Society to function as an advisor to the VSBK committee	✓	✓	
April 29, 2001	Fixing of wage rate for green brick transportation Committee to take steps to store the green bricks			✓
May 10, 2001	In light of accumulation of a large number of green bricks, each family to contribute free labour to transport 1000 brick each from the moulding site to the brick stacks near the kiln		✓	
June 5, 2001	Emergency Meeting to deal with petty thefts at the site		✓	
Aug 10, 2001	All families to contribute labour for laying pipes for water supply to the moulding site		✓	
Sept 12, 2001	Fixing of compensation for land provided for the kiln		✓	
Sept 16, 2001	Finalization of persons to work at the kiln and their roles and responsibilities Rs.120 per family to be contributed by end-December towards their contribution to the share capital	✓	✓	
Dec 17, 2001	VSBK staff not to be on the VSBK committee	✓		
Jan 7, 2002	Decision to have only one committee (Asuramunda Gram Unnayan Samiti) for all activities instead of many			
Jan 29, 2002	Fixing of rules and operating procedures for the VSBK	✓	✓	
Feb 28, 2002	Sales Supervisor to market the bricks more actively VSBK Committee to fix the price of bricks to be sold			✓
Mar 15, 2002	The huge stock of accumulated broken bricks to be sold @ Rs 200 within the village and Rs 300 outside the village per 1000 bricks			✓
Mar 23, 2002	Financial support from Gram Vikas to be stopped	✓		
May 12, 2002	The kiln to be closed on 14 May 2002			✓

Future directions

According to the Yearly Plan of Operations 2001-2002, the focus of operations at VSBK Asuramunda will be on the following:

- **Technical stability**, in terms of streamlining of kiln operation, stabilizing output quality and achieving energy efficiency
- **Commercial viability**, in terms of maximizing sales volume and revenues and bringing production costs down
- **Managerial efficiency**, in terms of ownership transfer to the village committee, setting up of community based control systems, better accountability structures, optimal use of local labour, and capacity building of local youth for managing production and operations
- **Social relevance**, in terms of livelihood enhancement of participating villagers and empowerment of poor communities, reflected in community self esteem and self reliance, better working conditions for kiln workers and moulders

Gram Vikas is currently focusing on developing a downscaled version of the 2-shaft VSBK, essentially aimed at lowering the cost so as to make the technology more affordable for the village communities. This has been constructed at Mohuda, and is owned and operated by Gram Vikas.

Gram Vikas had planned that the community owned VSBK at Asuramunda will be run on a pilot basis for one year, till operational stability is attained. After a year of stable operations, the experiment is expected to yield adequate lessons to promote similar establishments in other villages in the area. It also envisages a surge in local interest if the experiment is successfully demonstrated in the pilot village. Other plans include the following:

- VSBK is viewed as an input to the RHEP in the long run. It is envisioned that once the technology package is streamlined, VSBK units will be set up for clusters of RHEP villages. In addition to supplying good quality bricks for the RHEP, these would generate local employment.
- Gram Vikas will encourage communities from other operational areas to take up similar ventures. Five to nine areas will be identified for setting VSBKs over the next three years, along the lines of community ownership and management. These initial kilns will need to be supported through external assistance, before communities start paying for them and establishing the kilns through their own resources. Community owned and managed VSBKs will be run on a commercial basis, and should be self-supporting in 3-5 years.



Section III Review

Chapter 8 : Review of the VSBK - Asuramunda experience

Chapter 9 :The way ahead

In this chapter...

✓ *Achievements*

✓ *Problem areas*

8

Review of the VSBK Asuramunda experience

Gram Vikas has been involved in the VSBK activities in Asuramunda since November 2000. It is envisaged that it would be 7-8 years before the complete ownership of the VSBK can be transferred to the village community (refer to Table 8.1). During this period, it expects that the following roles will have to be performed by the various stakeholders in the management of the VSBK.

Table 8.1 Time schedule for transfer of ownership in Asuramunda

Time scale	Village committee	VSBK committee	Gram Vikas
Initial three years	Overall guidance and accountability	Day to day functioning (construction of the unit, labour and other resources)	Training in operations, procurement of raw materials, accounts and finance management and marketing
Middle stages- Fourth to Sixth years	Overall guidance/ accountability	Day to day functioning, raw material procurement, marketing, labour management and accounts	Training, finance management, support and guidance for raw material procurement and production management
Later stages -seventh to tenth years	Overall guidance/ accountability, finances	Day to day functioning, raw material procurement, marketing, labour management, accounts	Technical and managerial backstopping

Achievements of the Asuramunda VSBK

Since the VSBK was commissioned in November, it has functioned for less than six months. In the first few months of its operation, the most significant achievements of Asuramunda are as follows:

Capacity building of kiln workers: The capacities of the kiln workers including the Supervisors and the firemen have been built to an extent that they can manage the entire operations by themselves. Presently, even though the Gram Vikas Site Supervisor is present in the village at the kiln, his inputs are required only in case of a crisis or an accident. The three Supervisors are able to manage all the operations on their own. Specific areas in which their capacities have been built are as follows:

- The workers learnt many operation related aspects like temperature control, ideal brick arrangement etc.
- During the initial months, the Supervisors faced severe problems in procuring the requisite quality of coal chips. The coal chips used for VSBK are not easily available, as they have practically no use in any other industry¹. Over time however, the Supervisors have become skilled at checking the quality of coal before purchasing.
- Coordination between transporters, moulders and firemen was achieved over time.
- Over time, the GV Site Supervisor and the other Supervisors have been able to instil a sense of discipline in terms of standard safety regulations and norms.

Capacity building of the community: Over time, the community has set up a number of systems for the management of the kiln as well as other management issues such as framing of rules and regulations for the VSBK, conflict resolution, crisis management etc. For a village community that has no experience of working together, getting this far is a commendable achievement.

- The villagers take an active interest in the VSBK.
- They have, using a process, judiciously selected

the committee to manage the kiln.

- The committee manages all functions except the monitoring of the shaft, which is done by Gram Vikas site engineer and the fire team.
- Over time, people have achieved better role clarity.

Stabilization of VSBK operations: The operation of the kiln itself has been stabilized after almost six months of experimentation, modifications, learning and unlearning.

Increased comfort level with working with a new technology: In terms of technology, the VSBK was a completely new concept for the villagers, and except for 2-3 persons who had visited Konkia and the images provided by the Gram Vikas staff at the time of motivation, they had no prior exposure to it whatsoever. In spite of this within six months, the workers have become quite comfortable with the operations.

- The villagers were totally unfamiliar with the practice of working in a factory like set-up, especially working in 8-hour shifts. In fact, during the initial months, many of them complained of sleepiness during the night shifts. Most of the workers learnt to deal with this over time and are now quite comfortable with the schedule of working through nights. In fact, most workers prefer to work in the VSBK at night so that they can take up some alternative occupation during the day.
- After initial reluctance, the workers at the kiln have become accustomed to safety measures like wearing helmets, safety glasses at the time of firing etc. Making the workers wear masks (to prevent coal dust from entering their noses and mouths) has proved to be relatively more difficult. The villagers are often reluctant to wear masks worn earlier by workers belonging to a lower caste. After continued convincing, the problem was overcome by giving individual masks to all the workers.

Improved standard of life for the moulder community: There are nine moulder families in Asuramunda, all of them migrating out every

¹ The initial firing of VSBK has to be done with C-grade coal. Once the fire stabilizes, F-grade coal, which is inferior, can be used.

year. This was the first year when no one migrated. For the moulder families who used to migrate to places as far as Hyderabad earlier, working at the VSBK has brought about a significant improvement in the quality of life in many ways. Firstly, the daily earning of a worker in the kiln – moulder, fire-team members, Supervisors or transporters – means a steady inflow of Rs.30-35 a day. Additionally, not being forced to migrate for survival offers other advantages, which go beyond monetary benefits.

- The living conditions at the work site are usually very poor as the moulders have to stay under temporary shelters in the winter months and they often fall ill in such conditions. Also, they are unable to keep other sources of income like cows, goats or poultry.
- They are more comfortable working in the home environment that offers familiar language, culture and reliable family support systems, especially in emergencies.
- Typically, during the migration months, which is as long as six months, the migrants are not in touch with their family members back in the village (typically aged parents, small children etc.). This exacerbates their vulnerability as they are forced to deal with any emergencies (illnesses etc.) by themselves.
- There is a perceptible sense of belongingness towards the enterprise and an increased sense

of confidence among moulders who are not forced to migrate any longer.

- The economics for the families work out better when all the family members live together in one place.

Gender impacts: The impact of the VSBK on women’s lives has been documented using the Gender Analysis Framework (GAM). This framework was originally developed by Rani Parker and also reproduced later in an OXFAM publication titled “A Guide to Gender Analysis Framework”. The impact of the VSBK has been analyzed at four levels, women, men, children and society/ community. As far as the moulder women are concerned, the benefits emerge essentially from not having to migrate every year to distant location. Table 8.2 documents the gender impacts of the VSBK, where benefits appear horizontally on the matrix. Four kinds of impacts are studied:

Labour: This refers to changes in tasks and the level of skill required.

Time: This refers to changes in the amount of time availability.

Convenience: This refers to the changes in lifestyle or standard of living or the level of comfort.

Socio-cultural aspects: This refers to changes in social aspects of people’s lives or their relationship with those outside the family.

Table 8.2 Gender analysis matrix

Level of Impact	Impact on			
	Labour	Time	Convenience/ Comfort	Socio-cultural changes
Women	<ul style="list-style-type: none"> • Working at Asuramunda means more work for women, as domestic chores also have to be looked after No change in skill level 	<ul style="list-style-type: none"> • Less free time available if they live in the village, especially for women in nuclear families 	<ul style="list-style-type: none"> ➤ Culturally more comfortable in familiar settings, same language ➤ Better support systems in terms of extended family and neighbors in home village ➤ Easier to attend to the needs of the children, while staying in their homes • Medical facilities available when migrate for moulding 	<ul style="list-style-type: none"> ➤ Women feel reassured as they are not separated from their families ➤ With access to liquid cash, they can repay petty loans

Men	<ul style="list-style-type: none"> • Effort required is more as unlike other places (where digging machines are used), moulders have to dig soil for moulding 	<ul style="list-style-type: none"> ➤ In case of any other work, it is possible to adjust shift duties with others 	<ul style="list-style-type: none"> ➤ Assured income ➤ Staying in their own village, moulders can go in for other income generation activities alongside, such as poultry and cattle rearing, vegetable growing etc. • No advance is given on salaries here 	<ul style="list-style-type: none"> ➤ Higher sense of security, especially in medical and other emergencies ➤ n s t i l l e d sense of belongingness towards own village ➤ R e d u c e d vulnerability in familiar settings
Children		<ul style="list-style-type: none"> ➤ Moulders are not forced to leave small children unattended 	<ul style="list-style-type: none"> ➤ Children get better care (from grandparents, other relatives etc.) when parents go to work 	<ul style="list-style-type: none"> ➤ Children can go to school in their own village
Society/Community			<ul style="list-style-type: none"> ➤ Young girls can work within the village instead of having to go to the nearby towns 	<ul style="list-style-type: none"> ➤ No more migration of moulder families ➤ M o u l d e r families remain together throughout the year and do not have to separate
• Positive impact	➤ N e g a t i v e impact			

Problem areas

As of now, the VSBK at Asuramunda has been operated for just about six months. It is perhaps somewhat premature to carry out a critical assessment of the process at this stage. Nonetheless, some of the key areas that need to be examined carefully at this stage are as follows:

Kiln operation

While the process of production of bricks has been streamlined at the Asuramunda VSBK, there are still some operational problems that are recurrent

in nature and stem from the fact that the kiln has some basic structural problems.

- **Construction of the shaft:** At the time of construction of the kiln, mud packing in the shaft was not done properly, as a result of which the one of the shafts collapsed. The second time when it was reconstructed, mud packing was carried out only after the shaft walls had been constructed right up to the top. By then the inner walls had already become a little concave. As a

result of this shape, a few bricks get jammed in the shaft on a regular basis. To avoid this, bricks have to be packed in loosely in the shaft, this however causes other problems like decreased fuel efficiency and bricks getting stuck in the fire holes.

- **Fire holes:** Bricks get stuck in the fire-holes, which are provided along the side of the shaft walls. The workers mentioned that on an average, this happens 8-10 times in a month. This problem is countered to some extent by leaving a gap along the sides of the shaft wall at the time of arranging the green bricks in the shaft.
- **Brick size:** Arriving at the optimum brick size that would be acceptable in the local markets has been a long and painstaking exercise for the people working at the kiln. Initially, the shaft size permitted bricks of 9"X4"X3" instead of the 10"X 5"X3", which is popular in the local markets. During the initial few months, the prospective customers were unhappy with the brick size and stocks did not move. After several trials, the optimum size has now been achieved by a specific way of arranging the green bricks in shaft for firing (diagonally, as against lengthwise along the perimeter of the shaft walls). This however means that out of 332 bricks per layer, 16 have to be broken and arranged in a way that fills the gaps between the other diagonally bricks and the shaft wall. Normally the green bricks that get damaged are used for this. According to the Site Supervisor, out of the total of 3,65,000 bricks sold so far, only the last 12000 bricks were of the desired size.
- **Bottom opening of the shaft:** According to the Site Supervisor, the direction of wind at the site is such that there is a continuous upward draft from bottom of the shaft, which can cause uneven burning. The technical expert from Damle Clay Structural suggested that the bottom opening should be replaced by a door, which can be kept open or shut as per the wind direction and force and opened at the time of unloading. According to the Site Supervisor, they have not been able to install the door, as the shaft wall would not be able to take the weight of the door. Now, it is

planned to raise a wall enclosing the unloading zone, along the perimeter of the bay. As of now, red bricks are stacked along the perimeter of the bay to stall the wind.

Kiln management

Labour problems

In the Konkia kiln, the most recurrent problem was that of labour. In fact, in Konkia, the required number of firemen (4) was seldom available for operations. In Asuramunda too, this problem has surfaced several times. Before the kiln was closed down in May 2002, a large number of green bricks collected at the moulding site simply because there were no labour available to transport them to the kiln. The number of labourers working for transportation came down from 15-20 (for 6000 bricks per day) to two, before the kiln had to be closed down. However, even in the normal course of operations, transportation of bricks is a problem that recurs every Monday, the day when all the villagers go to the haat².

The primary reason for the labour problem is that during some part of the year, other employment opportunities, which are more remunerative than the VSBK, are available in and around Asuramunda. The forestry department, for example, pays Rs 50 per day for nursery-raising, maintenance etc. and Tendu leaf collection fetches Rs 80 per day. On the other hand, the VSBK pays Rs 40 per 1000 bricks transported from the moulding site to the kiln, which works out to substantially less than other daily wage labour options. It is interesting to note that even though these alternatives are available for very short periods (Tendu leaf collection work provides employment for less than a month every year and the forestry work is available only during the monsoon months), there is a tendency among the labourers involved in brick transportation to switch over to other occupations. There is a need to work out a sustainable solution to this problem. At one time, the committee considered offering

the green brick transportation work to labour from other villages, but this was given up as labour from other villages were interested in working at the VSBK only if they get employment on a continuous basis. Eventually, the VSBK committee

² Weekly village market

came up with a rotation system for deciding which households will go for employment outside the village and who will work on the VSBK. It is yet to be seen how this system functions.

Material management and Inventory control

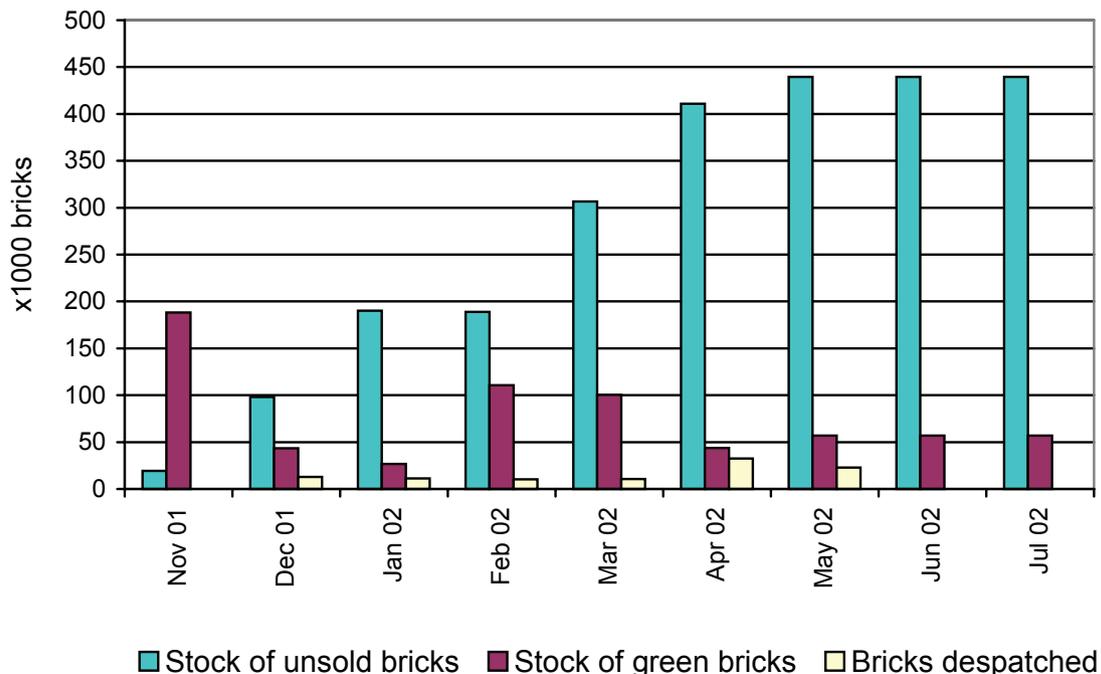
In both Konkia as well as in Asuramunda, inventory control has been a problem area, albeit for different reasons. In Asuramunda, the VSBK started operations in November, and by March-April, huge stocks of red bricks had been built. Unfortunately, the quality of most of these bricks was poor because till then, parameters such as temperature, soil mixtures etc. have not been optimized. During the same time, more than 2 lakh green bricks were damaged due to off-season rains. By April, the stock of green bricks had almost depleted. In such a situation, there was reluctance on the part of the Asuramunda community as well as Gram Vikas to continue production. The reluctance to further build stocks essentially stemmed from the following factors:

- Depletion of green bricks stock
- The physical presence of huge quantities of unsold bricks

- A lack of confidence in the technology and the product and the resultant lack of confidence in saleability of bricks already stock-piling
- Damage caused by the rains and the realization that a proper storage facility needs to be created if such wastage has to be avoided in the future
- Stopping of financial support from Gram Vikas in March 2002

Data on the VSBK operation shows that the inventory levels of raw material, green bricks in this case, as well as finished inventory, i.e. red bricks fluctuated widely between November 2001 and June 2002 (refer to figure 8.1). Over this period, green brick moulding continued at a steady pace. However, because of a few spells of unseasonal rains, they got damaged in large numbers and the total green bricks stocks kept fluctuating. During the same period, the stock of unsold bricks increased considerably. However sales were sluggish because of a variety of reasons (improper brick size, inconsistent quality), and the proportion of bricks despatched remained small as compared to the inventory maintained.

Figure 8.1 Inventory levels of green and red bricks



By the monsoons of 2002 however, the scenario changed completely and the demand for bricks rose sharply. The VSBK committee managed to sell all the piled up stocks of red bricks. In fact, many contractors were willing to pay a much higher price for any bricks (up to Rs 1200 per 1000 bricks) they could get during July- August. However, by then, the Asuramunda brick stocks had been exhausted completely, having sold at an average price of Rs 900 per 1000 bricks, considerably less than what they could have fetched later.

Technically, the VSBK can operate practically throughout the year, closing only for routine maintenance. In Asuramunda however, the primary reason for the kiln closing in May was depletion of green bricks. Notwithstanding the fact that in this particular case, the rains damaged a large number of green bricks, there is a need for careful inventory planning, so that

- The kiln can be operated throughout the year, and
- It is able to respond to the market demands as and when required.

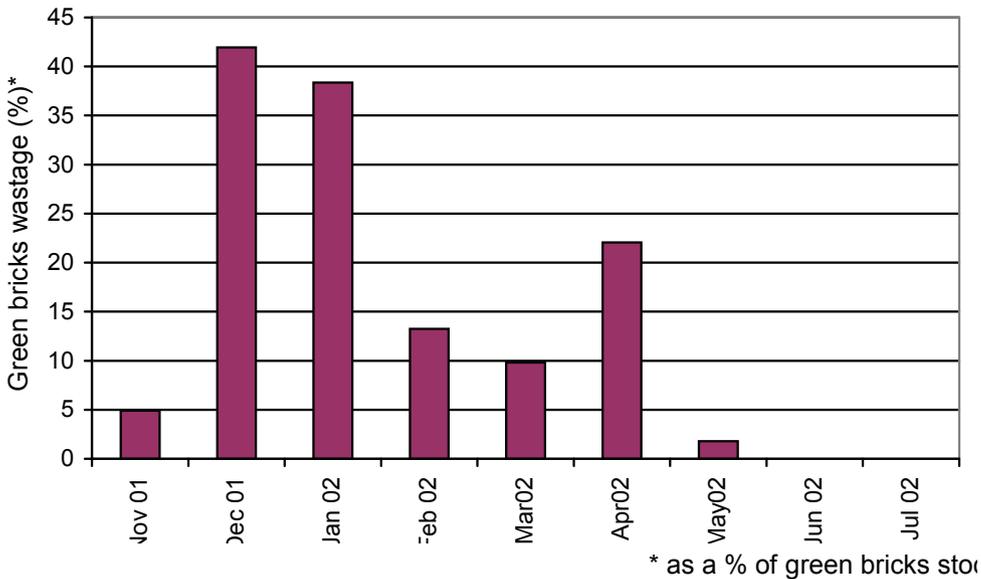
Transportation and other losses

Gram Vikas expected the following breakage percentage during the production process:

- 1-2% - From drying to pre-loading point (Green Brick stage)
- 2-4% - From loading in the kiln to stacking point (Red Brick Stage)
- 1-2% - At despatch point

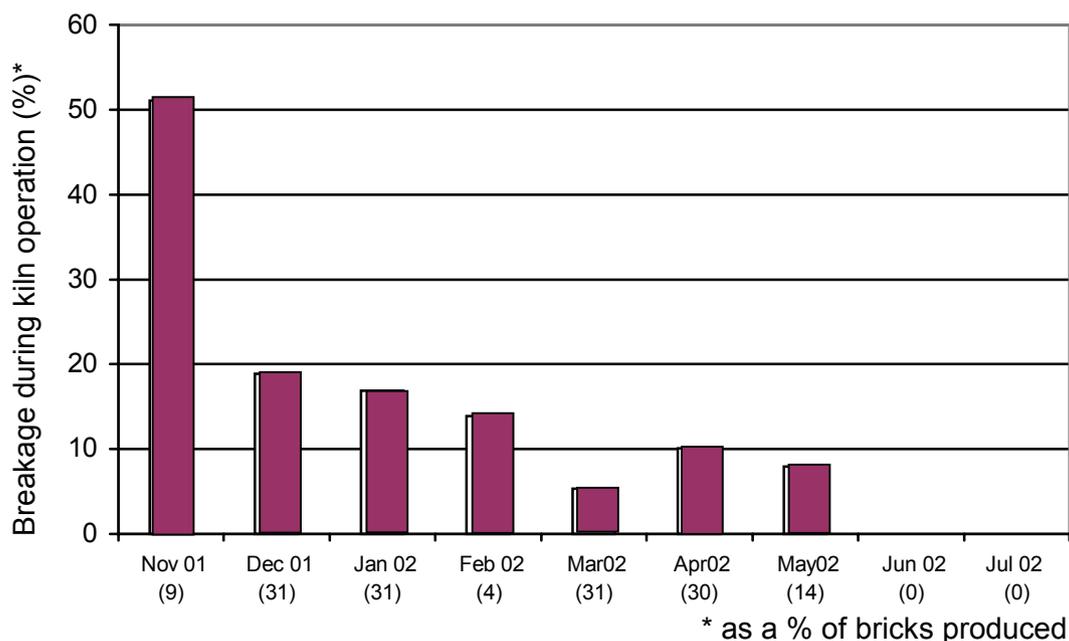
During the first year of operations, the losses have been much higher than anticipated, for avoidable reasons as well as those that were inescapable. Figures 8.2 and 8.3 show the extent of loss in green bricks as well as red bricks. Maximum damages were inflicted by two spells of un-seasonal rains when more than 2 lakh green bricks were washed away. The average kiln wastage (breakages, improper burning etc.) for the six months of operation has been around 13%, while the green bricks wastage has been higher at almost 20%³. Transportation loss has been the other area that needs attention. As the labourers are still not fully trained in loading red bricks in the tractor, the breakage rates have been high. What however is encouraging is the fact that both these percentages have been declining consistently over the six months. Hence it can be inferred that as the capacities of the workforce are being built and operations streamlined, the extent of losses are likely to decline further.

Figure 8.2 Wastage level of green bricks



³ Not accounting for the damage caused by the February rains.

Figure 8.3 Wastage level of red bricks



Marketing

Being the first year of operations, the villagers are yet to have faith in their product and hence are somewhat hesitant in marketing. As a result, marketing efforts have not been in line with the market demand. So far, the promotional efforts made by Gram Vikas have been largely in terms of contacting the government officials. It has also designed and printed some promotional material in Oriya, which is put up in villages, block office etc (refer to figure 8.4). Even though the VSBK committee has appointed a Sales Supervisor, who is responsible for the sale of bricks, marketing has largely been reactive. Till now, the interaction with the brick producers in the region has been low owing to the off-season in brick production⁴.

Interactions with contractors and masons in the surrounding areas indicates that the primary reasons why they purchased VSBK bricks are (a) as the kiln is close by, the transportation losses are lower and (b) Gram Vikas offers convenient credit terms unlike other brick suppliers in the district. In fact, for most, these factors are just as important and influence their purchase decisions significantly. Another feedback was that till some time back, the

quality of VSBK bricks was somewhat inconsistent, but this has stabilized now (corroborated by the fact that the temperature range for the VSBK, which was being experimented with till some time back, has been optimized now). Regarding brick quality, the general perception is that because the VSBK bricks are baked in a cement and concrete structure, they should be of better quality than others.

Specific suggestions made by construction contractors in the region are as follows:

- Introduction of sales promotion schemes such as replacement of bricks damaged in transportation. For the VSBK, this would essentially mean transporting a few additional bricks every time a consignment is delivered and replacing, on the spot, bricks damaged in transportation.
- As a quarterly or bi-annual event, Gram Vikas can invite contractors/ masons/ other persons involved in the construction business to Asuramunda, and organize a demonstration of the bricks (perhaps over tea or dinner).

⁴ All the local brick producers in the vicinity set up clamps during the season (December to May). Therefore they do not have any permanent production facilities.

- They can also introduce a commission system for contractor/ masons who get them sales orders.
- Marketing should be done at the block offices, through commission agents (construction contractors) and village clubs.

Figure 8.4 Promotional material for VSBK bricks



Since the past few months, people are getting to know and appreciate the VSBK. The kiln has been attracting popular interest and a number of market enquiries are coming in. One of the positive developments is that the District Collector has asked the local Block Development Officers to source their brick needs from Asuramunda. At this stage, there is a need to make use of the potential opportunities and undertake aggressive marketing.

It is quite evident that the persons who are responsible for the marketing of the VSBK bricks need to be trained in marketing skills. Bhagirathi, who is the Sales Supervisor, was the President of the committee during the construction phase. He was quite

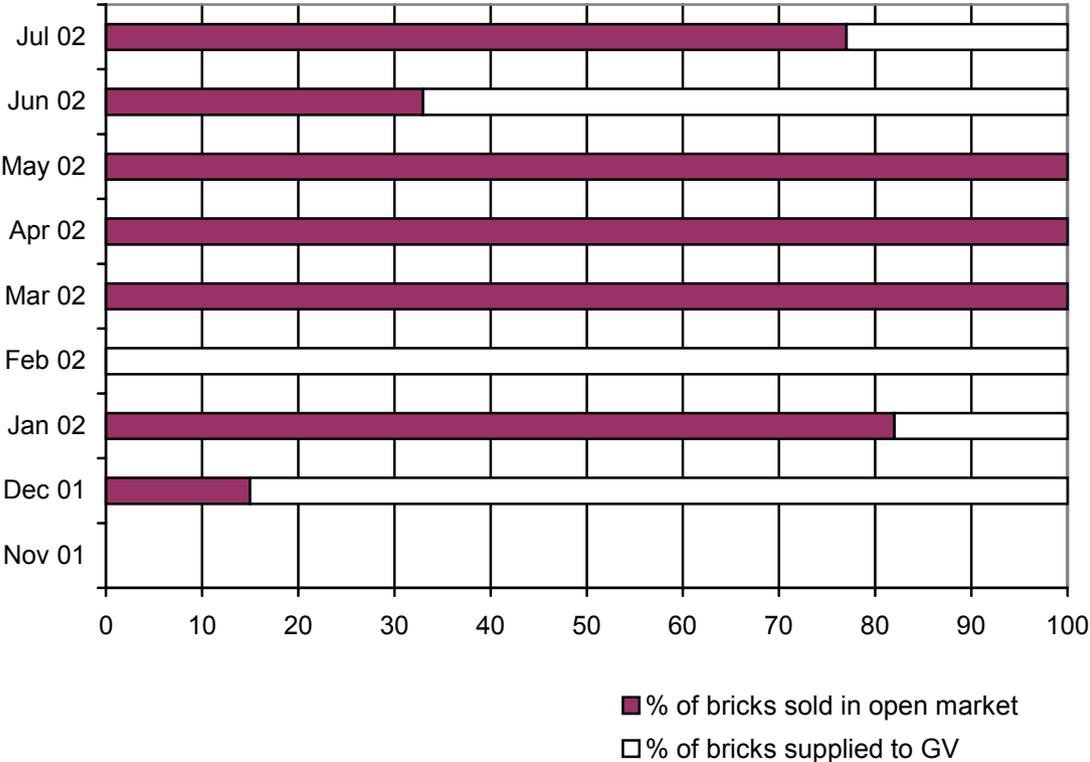
effective at contacting suppliers for procurement of materials and coordinating between Gram Vikas engineer and workers. He, during this period, also developed contacts with the market in general. Therefore, he was a natural choice to handle sales, when the villagers were selecting a person to do that job. There is a need to orient him towards aggressive marketing, promotion, advertising, effective sales talk etc.

Credit policy

As of now, there is no specific policy on offering credit to customers. Each case is reviewed individually by the committee and to a large extent,

the Sales Supervisor decides on what credit terms should be offered to each customer. In January 2002, 9200 bricks were sold to the Panchayat Samiti, towards which no payment has been received so far. According to the Sales Supervisor, this payment (and for all other government works) will be received only after the work is completed and accounts closed, which could take anywhere between six months and a year. The Asuramunda VSBK has also supplied, on credit, bricks to Gram Vikas for purposes like construction of a community hall within the village etc. In fact, almost 30% of the total bricks sold so far have been to Gram Vikas (refer to figure 8.5).

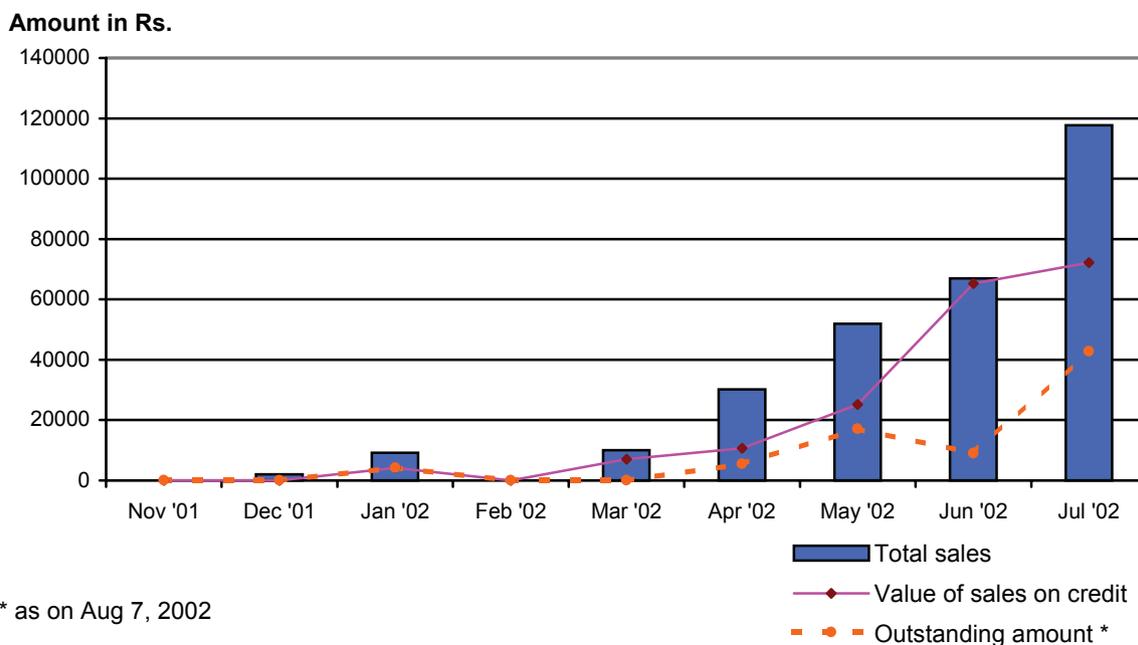
Figure 8.5 Share of sales in the open market



As of 07 August 2002, the payment for all the 1,01,163 bricks supplied to Gram Vikas was pending. In fact, except for one occasion when 30,000 bricks were sold to Gram Vikas at Rs 700 per 1000 bricks in July 2002, the sale price for the rest of the transactions was not even fixed. In the absence of a clearly laid out credit policy, the ratio of credit sales to cash sales turned out to be considerably high (refer to figure 8.6). As of August 2002, 65.8% of the value of total sales was

accounted for by credit sales. Of this, 42.5% was receivables due. It must be mentioned however, that ever since Gram Vikas stopped providing financial support to Asuramunda, the collection performance has improved significantly, and the committee is making significant efforts to collect dues for all sales made on credit.

Figure 8.6 Status of receivables



Financial performance and loan recovery

The feasibility report of Asuramunda VSBK estimated that on an average, 2.5 to 3 lakh bricks could be sold every month. Between November 2001 and May 2002, 5,39,568 saleable bricks were produced. Till July 2002, 3,40,387 bricks were sold, out of which 1,01,163 were sold to Gram Vikas. At the current level of operations, the break-even volume of sales⁵ works out at 5,97,522 bricks (refer to table 8.3). This translates to an operation level of 14 lakh

bricks per year⁶, or 1.16 lakh bricks per month. Clearly, the production and sales level will have to be stepped up if the operations have to break even. According to the feasibility report prepared by Gram Vikas, the net profit for first and second years were projected at Rs. 3, 08,463.00 and Rs. 4,10,070.00 respectively. According to Gram Vikas, the loss incurred so far this year has been in the range of Rs 73,000.

⁵ Break-even point or break-even volume is the volume of sales at which all the costs incurred in the business are recovered. The fixed costs that must be recovered from the sales revenues after the deduction of variable costs determines the sales volume required to breakeven. This also means that any amount of sales after this would result in profits for the business. At breakeven point, the total variable costs plus the fixed costs is equal to the total sales revenue.

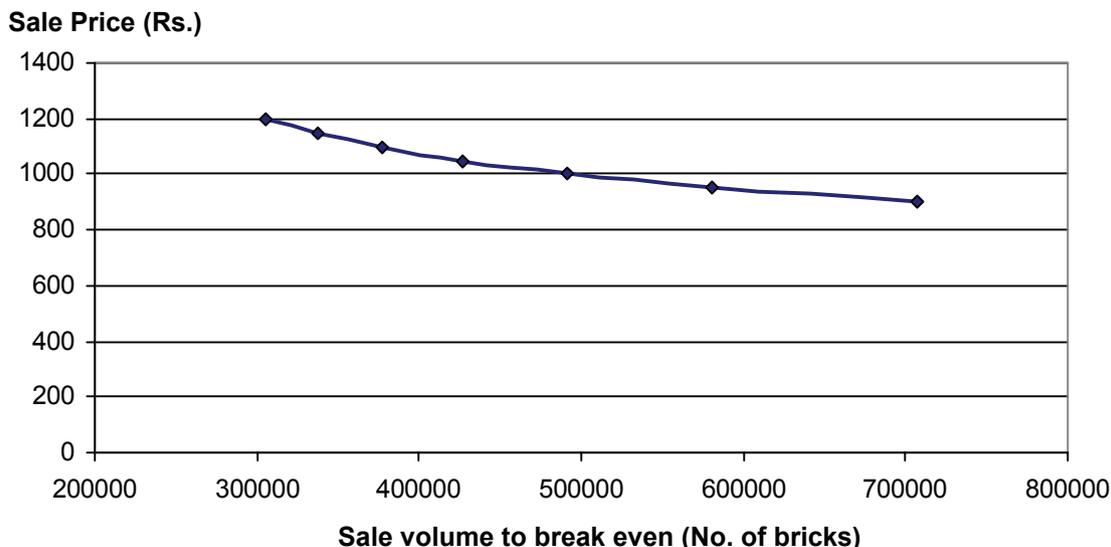
⁶ According to Gram Vikas, the threshold level of production and sales is 10 lakh bricks per year, and a market within 50 km radius.

Table 8.3. Contribution and Break Even analysis (Nov 2001- Mar 2002)

	Amount (in Rs.)
Total saleable bricks produced	539,568
Bricks sold	134,193
Average revenue per 1000 bricks	942
Per unit sale price	0.94
Variable costs	
Raw materials	14,470
Land cleaning	120
Transportation cost	62,342
Moulding charges (including moulder transport and moulds)	1,54,563
Fuel	1,02,046
Other consumables	1,408
Selling expenses	27,647
Total variable costs	3,62,596
TVC per 1000 bricks	672.01
Fixed costs	
Supervisor salaries	9,110
Firemen salaries	88,198
Electricity	650
Cost of accessories	1,159
Depreciation	62,207
Total fixed costs	1,61,324
TFC per 1000 bricks	298.99
Total cost	5,23,920
TC per 1000 bricks	971.00
Unit contribution margin	0.27
Break even point	5,97,522

A price-sensitivity analysis shows that the break-even volume varies significantly with the selling price of red bricks (refer to figure 8.7).

Figure 8.7 Break-even levels of sales



Right from the beginning, it was made clear to the Asuramunda village community that the VSBK is being financed on a loan basis. The rate of interest on the loan given will be 12% and the amount will have to be repaid in 3 years. It was also agreed that share capital @Rs.1000 per family would be raised by all the 50 families.

profit sharing mechanism

- Repayment of loan - 50%
- Contribution to village committee - 5%
- Creation of a village development fund - 10%
- Kiln maintenance fund - 10%
- Dividend pay out - 25% of which 12.5% to share capital and 12.5% to suppliers of green brick

During the initial few months of the kiln operation, Gram Vikas provided working capital support to the unit. As a result, there was a kind of complacency in the villagers, stemming largely from Gram Vikas's continuous support. The financial support was withdrawn with effect from March 31, 2002 and it was only after the drying up of funds from Gram Vikas that the people made significant efforts towards selling the bricks in the market.

Gram Vikas however continues to support them as and when required, though not in financial terms. Some time back, it made a tractor available for Asuramunda for transportation of red bricks.

Even though there is an implicit understanding that Gram Vikas's loan has to be repaid, the repayment terms have not been worked out yet. The Asuramunda committee has not yet started returning the loan. As of now, it plans to repay Rs 1,00,000 after the first year of operations. Gram Vikas plans to plough back these funds into developmental activities for the village, though this has not been discussed with the committee or the village community.

The yearly plan of operations for 2001-2002 mentioned that the share capital would be fully paid up by December 01. The contribution towards the share capital has however been very slow. As of June 15 2002, out of Rs 50,000, Rs 6013 had been collected. According to the RHEP coordinator, this is a priority area right now.

Accountability systems

While the roles of the functionaries of VSBK (committee members, supervisors etc.) have been

spelt out in the Agreement, there is a need for greater accountability. As of now, no systems for either rewards or penalties have been instituted. For example, the moulders are responsible for the green bricks only up to the initial stacking stage and any damages from the point of initial stacking is borne by the VSBK. In principle,

the Green Brick Supervisor is responsible for the safety of the green bricks, however in case of damages, no penalties are levied. Direct fallout of this lack of accountability was seen when an unseasonal downpour threatened to damage a huge stack of green bricks, but for a long time, neither any of the committee

members nor the workers, turned up at the site to take any corrective action. Gram Vikas's thinking on this issue is that once the systems stabilize, villagers must take the initiative and institute, not only penalties for slip-ups, but also rewards for

commendable performance. This is well in line with their policy of letting the people learn at their own pace.

Community dynamics

Community ownership and management has been the cornerstone of the

Asuramunda experiment. In the VSBK, the community is involved at three levels:

- As workers employed in the kiln,
- As the general body that takes majority of the decisions, and

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- As the executive committee, that is an elected body of nine members and is responsible for decisions of an urgent nature.

As of now, the dialogue between Gram Vikas and the villagers is governed by lack of pressure - Gram Vikas does not insist that the villagers do as per what it says. This has helped in finding innovative ways out of tricky situations and enabled the villagers to have a great amount of belief in their abilities. At the same time however, this has also meant compromises on other fronts. At this point, there are certain community dynamics in play that need to be examined carefully. The two most

important factors that govern the community dynamics vis-à-vis the VSBK are as follows:

Perception regarding the VSBK committee's role

The VSBK committee comprises of largely elders who are not employed at the kiln in any capacity. Gram Vikas had insisted that those who were paid by the kiln for their services could not also carry out management control. According to them, this was a conscious decision and meant to serve as a mechanism for the community to keep a check on the Supervisors. However, while the feeling of 'working for the village' prevails in a general sense, many of the committee members seem to harbour a feeling that they have no real stake in the VSBK operations. In fact, the very role of the committee is being questioned by some committee members as well as by some of the workers, albeit in an indirect manner. A case in point is village community's response to the untimely rains of February 2002. When it started raining, the villagers kept waiting for the VSBK committee members to take action to save the green bricks lying in the open, and each committee member waited for someone else to take action. As a result, no one from the village came to the VSBK site to cover the bricks and more than 2 lakh green bricks got washed away, before the Gram Vikas staff came and covered the remaining bricks with a polythene sheet. While this phenomenon may be typical of most common property resources/facilities, it can have serious implications on the working of the VSBK in the long run.

Decision making balance

In the present management structure, the three Supervisors and the GV Site Supervisor are responsible for the day-to-day functioning of the VSBK. The decisionmaking power however lies with the committee. Now, the committee has nine members who have their own preoccupations and are not available for meetings and collective decision-making at all times. On few occasions, this has resulted in time loss and consequent delays in decision-making. On one occasion, when the green bricks were getting damaged in incessant untimely rains, the Site Supervisor wanted to close operations, but had to wait for several days before the committee could meet and take a decision on the same. As a result, the kiln operations had to

continue for many days, even though more than 50% of the red bricks produced were damaged. Another instance of delayed decision-making was experienced in June 2002, when the market price of bricks rose to 950 per 1000 bricks. In light of the high demand, the Sales Supervisor wanted to hike up the VSBK brick price to Rs 1000 per 1000 bricks and put up the issue to the village. Unfortunately, it was 10 days before the committee could convene a meeting and take the decision to increase brick price, losing, in the process, considerable revenue. Given this situation, there is a need to review the decision making structure, especially between those directly responsible for the kiln operation and the committee.

Women's involvement

Women can be involved in VSBK operations at several levels: as transportation labourers, as kiln workers, as moulders, as committee members and as part of the general body of the village. As of now, women are involved in the VSBK operations as transporters of bricks and as part of the general village body. The women transporting the bricks (green bricks from the stacks to the kiln and red bricks from the kiln to the storage dump) are mostly unmarried girls, working 8 hours a day, their earnings contributing to the family's pool of resources. The married women who work in the kiln, are mostly from the SC community. Some women also assist their husbands in moulding. Typically men take care of the soil digging and mixing (which require more labour), and women mould and stack the green bricks. In Konkia, women had been involved in the VSBK operations

quite effectively, but this has not been done so in Asuramunda. According to the menfolk, the VSBK can provide employment only to a fixed number of persons and no more. In a situation when even the men are either not employed or are under-employed, women's employment is not a priority area. In terms of decision-making, there are two women on the VSBK committee, but their involvement is minimal.

Other factors that restrict women's involvement in the VSBK operations are as

follows:

- Women feel that their primary responsibility is to look after their children and homes, and that it is difficult for them to work in shifts.
- During the monsoon months, women are required for transplanting during the day and cannot be spared. Similarly, during the winter months of December and January, women are engaged in vegetable production and do not have spare time.
- In general, the men are not in favour of their wives and daughters working at nights. This stems primarily from cultural reasons and physical safety related concerns.

In this chapter...

- ✓ *Initial deductions*
- ✓ *Challenges*

9

The way ahead

One of the objectives of this documentation was to test the hypothesis that VSBK is technology that a village community can operate and manage profitably ensuring distributive justice as well as sustainability. In Asuramunda, Gram Vikas started the process of interactions around the VSBK in 2000. After the intensive process of motivation, the VSBK was finally commissioned in November 2001, and operated till May 2002, when it was shut down for the season. During this period, many barriers were overcome and lessons learnt in the process. As of now, the kiln has not yet run sufficiently long to make any conclusive judgements on the experiment. Undoubtedly, it offers valuable lessons in a variety of issues including alternative models of disseminating VSBK technology, community enterprise etc. Based on this short experience, it is difficult to draw any definite conclusions regarding the success of the venture and its long term sustainability. However, some initial deductions do emerge.

- An economic enterprise is perhaps the best driving force around which villagers can be motivated to act and come together.
- It makes practical sense to work around and build on a traditional occupation that village

communities are familiar with, as opposed to introducing something entirely unfamiliar.

- Villagers, with no prior exposure to VSBK type operations, do not find it complex to operate. In fact, within six months of operation, the Asuramunda fire team displayed an amazing degree of familiarity and grip over the various technical processes.
- VSBK like operations can help enhance management skills of the communities in terms of collective decision-making, conflict resolution, tackling varied leadership styles etc.
- While it is relatively easier to train villagers in technology operation, skill enhancement on other production related aspects such as inventory control, marketing, quality assurance etc. requires higher investments in terms of time and effort.
- Community dynamics are best managed at the community level, with minimal interference and only critical inputs from the external agency.

Challenges ahead

The previous chapter details out the areas that need attention. Figure 9.1 presents a summary of the discussion therein, highlighting strengths in Gram

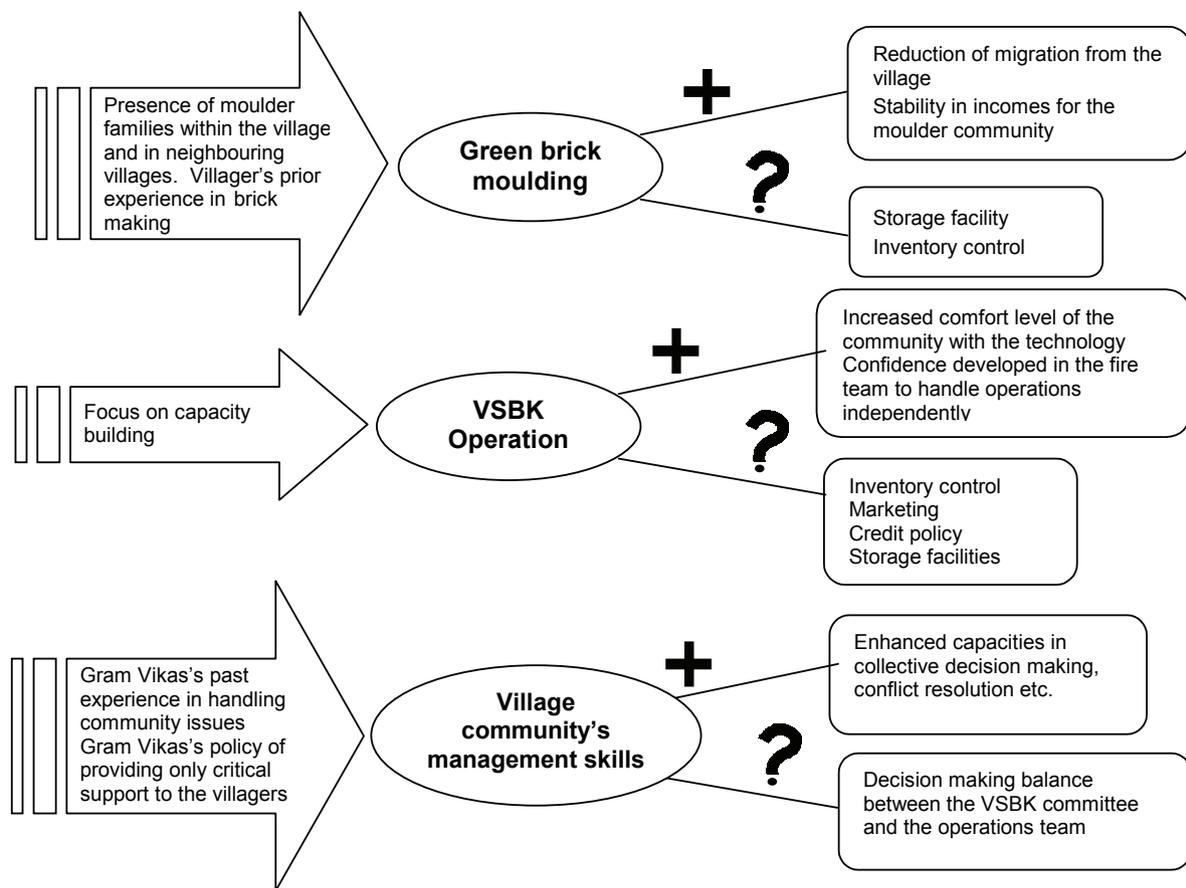
Vikas's approach in Asuramunda, positive impacts in the village and the alert areas that should be treated as early signs of potential problem areas.

Organizational dimensions

Focus on 'doing business'

Gram Vikas's approach in dealing with the community in Asuramunda has been quite successful. Considerable efforts have also gone into building the capacities of the community to handle regular operations of the VSBK. However,

as far as the kiln operation is concerned, there has been a greater focus on technology related matters than on the other issues fundamental to doing business. These include marketing, material and labour management etc. Now that the operations have been stabilized, Gram Vikas needs to focus on moving towards business-like-operations, instilling business acumen in the villagers, as well as equipping them with skills needed to handle business operations.



Institutionalize organizational learning processes

In an organization, there is a need to institute mechanisms to internalize experiences and incorporate learning from them, into future activities. Any activity or project must essentially build upon what has been created and not start anew. This is particularly significant in the case of innovative, cutting-edge programmes and projects with all the attendant risks and uncertainties.

In the case of the Asuramunda experiment, this is an area that merits greater attention. While both components of the IBP (the Technical Action Research phase at Konkia and the Social Action Research Phase at Asuramunda) offer important learnings, the progress of the project has been somewhat organic and self-evolving. Additionally, the pre-dissemination proposal does not adequately cover all aspects of Reduction of migration from the village Stability in incomes for the moulder community Presence of moulder families within the village and in neighbouring villages. Villager's prior experience in brick making Storage facility Inventory control Green brick moulding VSBK Operation Focus on capacity building Increased comfort level of the community with the technology Confidence developed in the fire team to handle operations independently Inventory control Marketing Credit policy Storage facilities Village community's management skills Gram Vikas's past experience in handling community issues Gram Vikas's policy of providing only critical support to the villagers Enhanced capacities in collective decision making, conflict resolution

etc. Decision making balance between the VSBK committee and the operations team the proposed experiment at Asuramunda. In specific terms, the documentation indicates that some of the critical areas like material and labour management etc. were not dealt with in sufficient detail at the project conceptualization stage. As a result, some of the problem areas in Konkia continued to resurface time and again in Asuramunda as well.

Typically, effective organizational learning can be brought about by (a) instituting formal self-assessments periodically, or (b) measuring performance against predecided indicators, developed at the project conceptualization stage, or a combination of the two. It is critical that at the identification and conceptualization stages of a programme or project, the people responsible for its design must make a thorough search of lessons learned from previous or ongoing projects and from the field of development cooperation at large. Programme managers and other stakeholders must also make certain that a learning culture is maintained throughout the implementation of a programme or project.

Periodic documentation

At this stage, there is a need to closely follow the developments at Asuramunda. It would be useful to undertake another documentation exercise in say, 15-18 months time, by when a good part of the handing over process would have been completed by Gram Vikas. The present study can be used as a benchmark to gauge the progress made.

A1

Annexure 1

Agreement between Gram Vikas and Asuramunda

Agreement

This agreement has been made on, the first day of December 2001, in the following manner between:

1. Party :

Executive Director

Gram Vikas, PO: Mohuda

Berhampur-760002 (Ganjam)

(Hereafter referred to as First Party)

And

Sri Bhagirathi Sahu, Father : Basudev Sahoo, President VSBK Committee Sri Sanatan Pradhan, Father: Hemasagar Pradhan, Secretary, VSBK, Committee (Hereafter referred to as Second Party)

2. Description:

The Second party is interested to build a Brick Kiln, with assistance from the first party. The Brick Kiln is based on Chinese technology (Vertical Shaft Brick Kiln) and will be situated at Asuramunda Village of Bakti Panchyat, in Agalpur Block of Balangir district. This kiln will be collectively owned and managed by the villagers of Asuramunda.

The rights of ownership of the VSBK shall lie with the shareholders of the VSBK. All the villagers of Asuramunda will be the shareholders of the VSBK. The value of each share of the VSBK is Rs. 10 and each household of the village should own a minimum of 100 shares.

The shareholders have already formed a working committee for construction and management of the VSBK project.

The members of both the parties shall be responsible while they are in charge (or till the successors of the posts are decided) for smooth execution of the agreement and are liable for judicial action, in case of violation of the agreement or a part thereof.

The goal of VSBK is to enhance self-employment, economic development and bring about a socio-economic change among the villagers. In addition to this the project aims at protection of the environment and for producing good quality bricks.

This agreement will be valid till both parties become self-sufficient and benefit economically from the VSBK

3. Fund Management: -

The first party shall provide financial assistance (in the form of a loan) except share capital, to the second party for the construction and management of the VSBK. The second party under sole guidance and supervision of first party shall spend the loan received. The Share Capital shall be deposited to the joint

account (in the name of first and second party) in the nearest bank. The deposited amount should not be spent under any circumstances. The Share Capital shall be maintained, as a corpus of the VSBK and the representatives or the successors thereof of the two parties shall operate the account.

The accountant of the first party shall audit all income and expenditure related to the operations of the VSBK maintained in the books of accounts by the second party.

4. **Conditions:** -

The conditions for the construction and management of the VSBK, which both the parties are expected to follow are mentioned below:

- a) **Site Selection for the VSBK:** - The first sparty should select the site for the proposed VSBK. The second party shall register the selected site in the name of the VSBK committee by 31st March,2001
- b) **Preparation for construction:** - The second party will prepare the site where VSBK is to be built by 25th December 2000. And a representative from the first party shall provide the lay out of the VSBK by 25th January 2001.
- d) **Construction:** - The VSBK shall be constructed with co-operation from both parties. For this, requisite material shall be supplied by both parties as per the following conditions:

The First Party:

The total requirement of cement, refractory bricks, skilled labour, refractory cement, iron rod and GI Sheets and half of the required number of bricks

The Second Party:

The total requirement of stone, clay, un-skilled labor, centering materials and half of the required number of bricks.

- d) **Machinery:** - The First party shall purchase all the required machinery for the VSBK. The amount spent for the machinery shall be a part of the loan extended by the first party towards establishment of the VSBK.
- e) **Green bricks:** - The raw materials for the production of green bricks (clay, water, digging equipment, moulds, etc.) and a place to store theAnnexures molded green bricks shall be provided by the second party The second party shall also be responsible for payment of all the Govt. fees for the VSBK.
- e) **Stability in Production:-** Till the stability in production and sales of bricks is achieved the First party shall provide necessary support.
- g) **Safety:** -The second party will be responsible for safety, maintenance, management and further development of the VSBK
- h) **Production and Management:** - For good management & stability in production of the VSBK, the first party shall provide technical support for the VSBK, for the first three years. However thesecond party shall pay their salaries and other expenses.
- l) **Marketing of Produced Bricks:** - Marketing of bricks, finding customers, and collection of credit by selling bricks and other related expenses should be managed by the second party. In addition to this all government and official work and liaison work related to the VSBK shall be the responsibility of the second party

Agreement Period: - This agreement is valid for a period of three years from the date of agreement.

6. Legal Rights: - In case of violation of this agreement or a part thereof, judicial action shall be initiated in a court in the area of jurisdiction, same as the first party.

7. **General:** - Two parties shall sign after going through this agreement thoroughly and after understanding this agreement, which is meant for the improvement of economic conditions, self employment & skill development of the villagers of Asuramunda.

Executive Director,

Committee

Gram Vikas, Po: Mohuda

Berhampur : 760002 (Ganjam)

Committee

(First Party)

1. President VSBK

2. Secretary, VSBK

(Second Party)

Witness to this agreement.

1. Alekh Pradhan, Asuramunda, PO: Mursundi, Dist : Bolangir

2. Baiskhan Pradhan, Asuramunda, PO : Mursundi, Dist : Bolangir.

A2

Annexure 2

Record of Asuramunda village meetings

Meeting 1 - November 15, 2000

- Villagers
- Gram Vikas represented by: Programme Manager, VSBK; Co-ordinator, Konkia VSBK; Project Co-ordinator, Bolangir RHEP; RHEP Supervisor, Asuramunda

Resolutions / points of discussion

1. Gram Vikas clarified that the rate of interest on the loan given will be 12% and the amount will have to repaid in 3 years. It was decided that a loan would be taken from Gram Vikas on these terms.
2. It was agreed that share capital @Rs.1000 per family would be raised by all the 50 families.
3. The profit from the unit will be shared as follows:
 - Repayment of loan - 50%
 - Contribution to village committee - 5%
 - Creation of a village development fund - 10%
 - Kiln maintenance fund - 10%
 - Dividend pay out - 25% of which 12.5% to share capital and 12.5% to suppliers of green brick

Meeting 2 - November 22, 2000

- Villagers
- Gram Vikas RHEP supervisor

Resolutions / points of discussion

1. A nine-member VSBK committee was formed with seven men and two women. Sri. Bhagirathi Sahu was elected President and Sri. Sanatan Pradhan, Secretary of the VSBK committee.
2. The committee was empowered to enter into an agreement with Executive Director of Gram Vikas regarding the construction of the kiln.

Meeting 3 - December 11, 2000

- Villagers

Resolutions / points of discussion

1. A bank account will be opened at Bolangir Regional Bank, Salebhatta branch, to be operated by President and Secretary of VSBK committee and Project Coordinator, Bolangir RHEP.

Meeting 4 - December 28, 2000

- VSBK committee

Resolutions / points of discussion

1. It was decided that villagers would make and supply 35,000 green bricks. Sri. Sanatan Pradhan was authorized to contact moulders and oversee the operation.
2. It was decided to ask Sri. Sukumuni Pradhan to make the wooden moulds of size 10*5*3 (inches) and supply him wood for the same.

Meeting 5 - January 31, 2001

- Villagers

Resolutions / points of discussion

1. 14 persons were identified by the meeting to work in the kiln construction site. These persons were asked to report for work regularly.

Meeting 6 - February 20, 2001

- Villagers

Resolutions / points of discussion

1. The meeting approved the names of four persons to be sent to Konkia for fireman training there. Whoever was willing to go was selected. Out of the four selected, one was from the moulder community.

Meeting 7 - March 12, 2001

- Villagers
- Gram Vikas, RHEP supervisor

Resolutions / points of discussion

1. The committee took a strong view on the issue of persons deputed to work shirking their responsibility. It was decided to levy a fine of Rs.50 on persons who default in working at the site.
2. It was decided that the VSBK committee will meet on every alternate day at 8.30 p.m. to take stock of the progress of work. A general body meeting will be held on every Monday. Annexures
3. Sri. Panibudu Bariha was authorized by the committee to supervise the work of the persons deputed by the village and was authorized to take action against defaulting workers.

Meeting 8 - March 26, 2001

- Villagers
- Gram Vikas - Project Co-ordinator, Bolangir RHEP; Site Supervisor

Resolutions / points of discussion

1. Sri. Kanhu Pradhan was nominated to the committee to fill the vacancy created by the resignation of Sri. Sarat Biswal.
2. It was decided that for better co-ordination between all people, the RHEP committee would function as an advisor to the VSBK committee. It was also decided that in case of any dispute, the views of the RHEP committee would prevail.
3. It was decided that land from which clay is excavated for brick making will be used later on as agriculture land and will not be let to remain fallow. VSBK would return the land to the owner after levelling.

Meeting 9 - April 29, 2001

- VSBK Committee

Resolutions / points of discussion

1. The committee decided to take steps to store the green bricks near the kiln.
2. It was decided that action would be taken against those who were removing wood stocked at the construction site.
3. The green brick transportation rate was decided at Rs 50 per 1000 bricks.

Meeting 10 - May 10, 2001

- Villagers

Resolutions / points of discussion

1. Large number of green bricks had accumulated. It was decided that each family would contribute free labour to transport 1000 brick each from the moulding site to the brick stacks near the kiln. This was accepted by all.

Meeting 11 - June 5, 2001 (Emergency Meeting to deal with theft at the site)

- Villagers

Resolutions / points of discussion

1. An enquiry was conducted about the two

tarpaulin sheets belonging to the VSBK committee. It was also found that a spade went missing earlier in the evening. Annexures Mandeep and Supersuna near whose house these were stored were questioned and they got very irritated. It was found that they had sold these materials to repay a loan taken for buying a goat. Since the two refused to admit their crime, it was decided that a case be filed at the police station.

2. It was decided that Laxman Pradhan will be paid Rs.50 for transporting the remaining green bricks from the moulding site to the stacks.

Meeting 12 - August 10, 2001

- Villagers

Resolutions / points of discussion

1. Sankar Pradhan was given the responsibility to dig the trench and lay pipes for supply of water from the water tank to the moulding site. All families will contribute labour for this.
2. It was decided that the village youth would contribute labour to clean and level the land around the kiln.

Meeting 13 - September 12, 2001

- Villagers

Resolutions / points of discussion

1. It was decided that Alekh Pradhan, whose land is used for excavating clay will be paid a compensation of 10 bags (75 Kg each) of paddy.
2. It was also decided that in case any of his irrigated fields are used for storage of bricks, some more compensation could be given.

Meeting 14 - September 16, 2001

- Villagers
- Gram Vikas represented by: Programme Manager, VSBK; Project Co-ordinator, Bolangir RHEP; VSBK Engineer Asuramunda

Resolutions / points of discussion

1. The list of persons to work at the kiln was finalized
2. Responsibilities in operations were fixed.

3. 24 staff were selected and appointed as supervisors and firemen, based on qualifications.

4. It was decided that a new members will be selected to the VSBK committee to replace the members who have joined the workforce

5. It was decided that a minimum of Rs.120 per family would be contributed by end- December towards their contribution to the share capital. Annexures

Meeting 15 - November 7, 2001

- Villagers

Resolutions / points of discussion

1. The meeting placed on record their gratitude to the various dignitaries who graced the inauguration of the VSBK.

Meeting 16 - December 17, 2001

- Villagers, Gram Vikas

Resolutions / points of discussion

1. It was decided that the VSBK staff will not be on the VSBK committee.
2. Issue of uneven sized bricks was discussed by the committee.

Meeting 17 – January 7, 2002

- Villagers

Resolutions / points of discussion

1. All the committees in the village were combined and the Asuramunda Unnayan Committee was formed.

Meeting 18 – January 29, 2002

- Villagers, Gram Vikas

Resolutions / points of discussion

1. Rules for the operation of the VSBK were drafted.

Meeting 19 – February 28, 2002

- Villagers, Gram Vikas

Resolutions / points of discussion

1. The Sales Supervisor was asked to undertake active marketing. It was decided that he will find out the price the customer is willing to

pay (on a case to case basis) and pass on the information to the committee, based on which the committee will take a decision.

2. The issue of transportation of bricks was discussed. Annexures

Meeting 20 – March 15, 2002

- Villagers

Resolutions / points of discussion

A large number of broken bricks had collected. The committee decided to sell them at the price of Rs 200 per 1000 bricks within the village and at Rs 300 outside the village.

Meeting 21 – March 23, 2002

- Villagers, Gram Vikas

Resolutions / points of discussion

1. Gram Vikas announced that the financial support will be stopped, and asked the villagers to sell the bricks in the open market.
2. Labour problem for transportation of green bricks was discussed. It was decided that the moulders would also be responsible for the transportation of green bricks.

Meeting 22 – May 12, 2002

- Villagers, Gram Vikas

Resolutions / points of discussion

The problem of increased absenteeism was discussed.ss

Annexure 3**Capital Cost of Asuramunda VSBK**

Estimated Capital Cost (according to feasibility report)

1	Land and Site Development			
a	Cost of Land 0.5 Ac	10,000.00		
b	Premium Payable on Leasehold land	500.00		
	Premium Payable on Leasehold land			
c	Cost of Levelling & Development of 1 Ac of land 200.00 @ Rs. 200/Ac	200.00		
				10,700.00
2	Plant and Machinery			
a	Plant construction	317,950.00		
b	VSBK Equipment	147,900.00		
				465,850.00
3	Buildings			
	Office Building cum store	20,000.00		
	Workshed	15000.00		
				35,000.00
4	Misc. Fixed Assets			
a	Furniture	5000.00		
b	Accessories and Spares	18060.00		
c	Office Stationery and Misc.	3000.00		
d	Electrical fittings for office and workplace	2500.00		
e	Equipment & Pipeline for water Supply	5000.00		
				33,560.00
5	Pre-operative Expenses			545110.00
	Insurance (10% of Plant & machinery costs)	23292.50		
	Technical Know how fees	20000	43292.50	588402.50
	Total Cost			
	TOTAL PROJECT COST			588402.50

Actual Capital Cost incurred in Asuramunda VSBK

1	Land and Site Development	5000.00	
a	Cost of Land 0.5 Ac		
b	Premium Payable on Leasehold land and conveyance charges		
c	Cost of Levelling & Development of 1 Ac of land		
2	Plant and Machinery		
	Plant construction	490,677.00	
	Shaft	297401.00	
	Roof and Ramp	184036.00	
	Add: 11000 bricks	9240.00	
	VSBK Equipment	95,740.00	
			586,417.00
3	Buildings		
	Office Building cum store		
	Workshed		
			21,514.00
	Misc. Fixed Assets		
	Furniture		
	Accessories and Spares		
	Office Stationery and Misc.		
	Electrical fittings for office and workplace		
	Equipment & Pipeline for water Supply		
			14,140.00
	TOTAL PROJECT COST		622071.00

Annexure 4

The operation of the VSBK

During initial firing operation, a fire is lit in the firebox. During continuous operation, one batch of dried green bricks is loaded in layers at the top at a time. Coal pieces are spread on each layer uniformly to fill the gaps. Each batch typically contains four layers of bricks set in a predetermined pattern. The stack of bricks rest on square support bars (which can be removed or inserted) and supported in turn by a pair of horizontal beams across the arches in the unloading tunnel.

The brick unloading is done from the bottom using an unloading trolley, which runs on rails along the length of the unloading tunnel. Lifting and lowering of the trolley is done using a single screw unloading mechanism. For unloading, the trolley is lifted so that the whole stack of bricks in the shaft rests on it. The support bars are taken out, when the load is released. The whole stack is then lowered till the layer with openings appears, through which the support bars are then reinserted. On further lowering, the load of the stack is taken by the support bars except for the batch being unloaded, which comes down along with the trolley finally

resting on a pair of rails. The trolley is later pulled out along the rails laid out on the floor of the tunnel. The bricks subsequently unloaded and sorted out for dispatch.

The next batch is loaded at the top from the green bricks lifted onto the loading platform. The frequency of unloading - loading varies from 90 to 150 minutes. The residence time of a batch in the kiln typically varies from 26 to 30 hours. Maximum temperatures of up to 1000oC are attained in the central firing zone. The hot gases moving upwards dry and heat up the green bricks in the preheating zone. This recovery of sensible heat accounts for the high energy- efficiency of the VSBK technology. For evacuation of exhaust gases, two rectangular chimneys are provided at opposite corners of each shaft. Lids are provided to cover the shaft top, which direct the gases to the chimney through the flue system.

A4

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