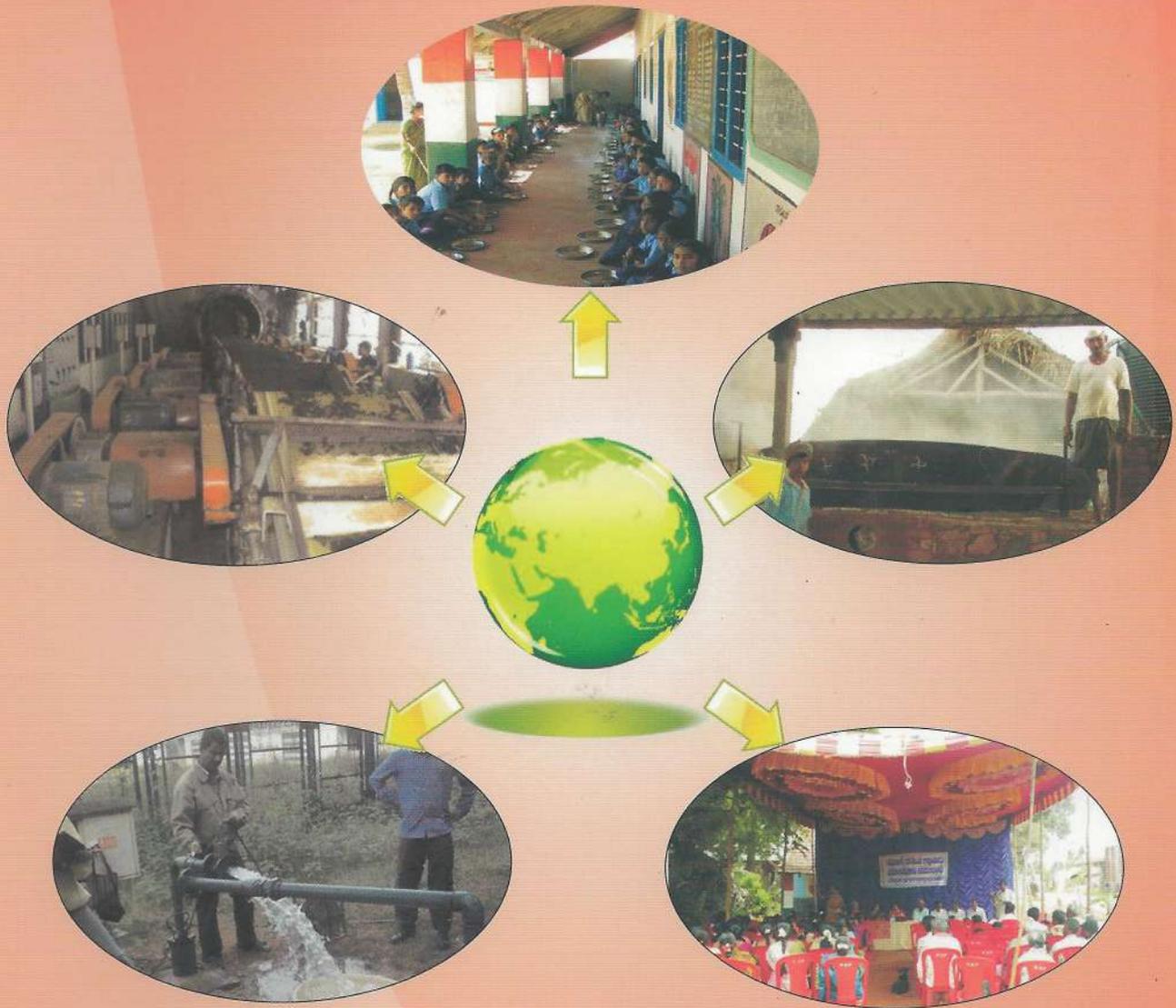


# Report 2008



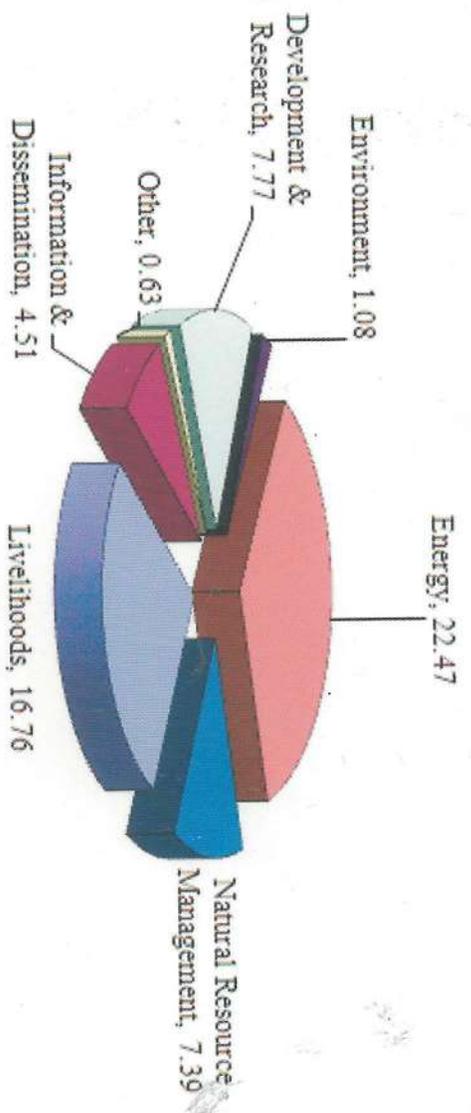
**TIDE**

**Technology Informatics Design Endeavour**

Catalysing Change Through Technological Interventions

# TIDE AT A GLANCE

## Area Wise Project Expenditures



- Livelihoods
- Information & Dissemination
- Other
- Development & Research
- Environment
- Energy
- Natural Resource Management

\*value in lakhs  
\*total expenditure Rs 60.63lakhs



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## TIDE - An Overview

The year gone by was in many ways a land mark year for TIDE. This year, after much introspection, we could define for TIDE a new vision and strategy for growth and self reliance. This vision required that the management of TIDE steer its transition from its time tested and stable non profit mode of project generation and implementation to a new path of commercialization, without giving up on the core values of TIDE. The object was to create two mutually dependent organizations - TIDE and a for profit organization Sustaintech India Pvt. Ltd. (SIPL). SIPL carved out of the experiences of TIDE as a social enterprise, would have access to the experiences and intellectual property of TIDE and by donating part of its profits to TIDE, contribute to its financial sustainability.

This new vision was simple and in many ways an obvious transition for an organization that has worked over a decade in several phases of technology dissemination - generation, adaptation, demonstration of commercial viability and sustained profitability, having spun off successful enterprises that have endured for about 5 years. We were questioned about our commitment to social impact at various platforms which required us to strive for scalability. Why then, did it take TIDE so long to embark on what was a very obvious institutional evolution? Perhaps acquisition of confidence and collective vision takes time; however the stimulus for this transition taking shape in 2008 was the exposure and the financial incentive that came our way through the Ashden award (TIDE was declared the International Energy Champion 2008 by the Ashden Awards). In addition to the finances that could be used for all the start up activities, TIDE also obtained the pro bono the professional services of experts who have assisted several other organizations in the conceptualization of similar low carbon ventures. We gratefully acknowledge the support from Ben Dixon, of the Ashden Awards, Hari Natarajan of the Global Village Energy Partnership and Jacob Wieneski of Arc Microfinance for enabling this transition./

Independent of these developments, the number of partners wanting to work with TIDE in projects is increasing. This year, in addition to our long term partners like the DST, ETC, Deshpande Foundation, and the small grants programme of the UNDP, we have added several new partners like the Sir Dorabji Tata Trust, Charities Aid Foundation, Hewlett Packard Foundation, and GSRD Foundation and have about 15 projects under implementation, the highest ever in a calendar year since its inception.

Another land mark achievement for TIDE has been the award of a medium sized project of the UNDP-GEF on 'Energy efficiency in tea processing'. The major achievement for TIDE in this project is the acceptance that it has gained from a sector where it had absolutely no influence. We are grateful to the Tea Board of India, for accepting to associate itself with TIDE and for the encouragement and credibility that has come our way through this association. We look forward to initiating energy use reform in the sector and demonstrating that green technology is also good economics.

So while the thought process is near complete for technology interventions in the renewable energy / energy efficiency sectors, we are still testing ideas that would lead to large scale technological interventions in water use efficiency and for creating new livelihood options for women through emerging technology.

The challenges for TIDE have now taken on an additional dimension. The work that it has done in the past with technological and societal innovations for technology inclusion will

have to be complimented with financial innovations for enabling technology access. Time will tell whether we have succeeded. But surely there is no problem in unequivocally stating that everyone at TIDE has done his or her best. The ultimate recognition would come, not from awards or peer appreciation but from the people at the grass root who would acknowledge TIDE as an organization that has tried its best. We seek that appreciation in much the same way as Abou Ben Adhem did when he cheerily said 'I pray thee, then, write me as one who loves his fellow men'.

**Svati Bhogle**

## **All India coordinated Research Project on Biomass based Dryers**

(Supported by Science & Society Division, Department of Science & Technology, Government of India)

This two-year project research project on biomass dryers for use in different geographical regions of India is being funded by the Department of Science & Technology of the Government of India.

The objectives of the project are:

- To identify geographical regions in the country where there is a great need for value addition of horticultural produce and partner NGOs.
- To identify horticultural produce that can be dried and to define the quality parameters for the dried products produced.
- To define and address research issues in biomass based drying of horticultural products.
- To train partner NGOs in local level drying.
- To carry out activities that would enable partner NGOs to evolve mechanisms for women's enterprise development.

The Himalayan, Sub-Himalayan region, North-east and Central India have been identified for introduction and demonstration of the biomass dryer. NGOs working in these regions were listed from DST's website and from reports of funders who had supported an earlier project of TIDE. About 10 NGOs were shortlisted from these based on their SHG network and their experiences with food processing and income generation for SHG's after correspondence, 5 NGOs were identified as partners for the project.

The NGOs conducted a preliminary survey based on a format provided by TIDE to provide information on the biomass availability, the range of horticultural products that are abundantly grown there along with the cost. This data was required to assess the products that could be dried and to estimate the economics of drying. The products that will be dried

include spices like turmeric, ginger, garlic, chillies; fruits like apple, pear, apricot, plum, citrus peels, jackfruit; and other products like oak, silk cocoons, areca.

Each NGO partner was then asked to prepare a proposal for submission to the DST based on a template sent by TIDE, to fund a research project for them so that they could avail dried products of marketable quality using the biomass dryer after receiving technical training from TIDE.

The NGOs have prepared the proposals and will be submitting them to DST. In the meantime, work is on to design a combustor for the dryer. This will help to burn loose biomass fuels like pine needles, which is the main biomass available in the Himalayan hills.

## **Core Support**

(Supported by Science & Society Division, Department of Science and Technology)

As in the past years and as mandated by the review team, TIDE has continued its mix of innovation and extension in the core support activities. TIDE develops at least one new product every year through core support. This year, the technical team at TIDE has developed the fuel-efficient frying stove. The challenge in this task was to make the design user friendly. Most women who prepare fried savories at home, preferred to have the stove embedded in the ground and the frying pan at a convenient height. They also preferred to sit and cook. While it was easy to construct a stove on site, it was difficult to make a prefabricated version of the same so that it could be disseminated to a larger number of users. TIDE therefore first developed a design of an onsite frying stove and tested it. The field testing of the same was done through an FES supported project. The innovative element of the design was the use of pins welded to the base of the frying pan to increase the surface area exposed to heat transfer. The stove has reduced fuel consumption by about 40% and improved the working environment for the cook. TIDE is now exploring low cost materials for a prefabricated version of the stove that can be embedded in the ground at a suitable height. This stove can be adapted for other applications like khova making etc.

Last year TIDE developed the finned tava stove for reducing the fuel consumption in making dosas, rotis, omelets, etc. But the material of construction of the dosa stove was steel with an insulated inner body. However as the price of steel was increasing, TIDE thought that it should explore cheaper materials for the same. It has therefore developed pre-cast ferro cement tava stoves and is testing it.

As a component of its extension activities TIDE has conducted technical training programs for women in household stove construction. These training packages were developed in earlier projects. It also interacts with women's groups to raise awareness about technology linked livelihood options and consults them on their needs. This year TIDE staff has participated in various events to promote socially sensitive science. It has participated and conducted a training program in mainstreaming gender in energy projects. It has developed and conducted training programs for masons and plumbers on rainwater harvesting. It has also networked with other organizations that scout and promote rural innovations. It has supported student trainees and volunteers to work on societal projects. Assessment of the

potential for biomass briquettes, use of solar energy, development of a monitoring system for tracking energy consumption were some of the activities of the trainees at TIDE. It has participated in the rural transformation track of PAN IIT 2008. It has evolved a linkage with an international body 'Engineers without borders' who work on similar projects and is in the process of adapting technology for waste heat recovery from rural project sites.

## **Development and Introduction Training Courses in Biomass based Drying Technologies**

(Supported by ETC Netherlands)

TIDE is currently in the second year of this 3 year project, which commenced in March 2007. The objectives of this project are to strengthen TIDE's capacity in developing training materials and methods in conducting courses in technical training and Micro Enterprise Development (MED) training. Four enterprises using biomass dryers would have to be established by women after having undergone TIDE's training courses.

In the first year of the project the team of TIDE attended various training courses to strengthen its training skills. A workshop on 'Communication with rural women was held to understand how to make any communication with rural women effective.

During the second year of the project, two training packages - one for technical training in the use of biomass dryers and the second for MED training - were developed. Each training package consists of a trainer's manual with handouts for participants, and training materials like slide-shows, films, charts, exercises and games. The technical package includes a Reference Guide on biomass dryers for trainers, in addition to other materials.

Four SHGs - two in Thrissur and Ernakulam districts in Kerala and two in Puttur taluk of Dakshina Kannada district in Karnataka- were identified in the first year of the project after applying various criteria. Technical training and MED training have been conducted for these SHGs, using the training packages developed.

The training of these 4 groups was an effective test of the two training packages in terms of the content and duration of the modules. They were found to be satisfactory. A few exercises have been modified based on the experiences of the training. The need to keep games sessions lively has been added to the trainer's notes.

After the training, the groups have begun using the dryer. The groups in Kerala are producing and selling dried prawn and fish, while the groups in Karnataka are drying coconuts and jackfruit papads in the dryer. In the final year of the project, assistance to develop market linkages for the products and services will be provided to the enterprises. The performance of the enterprises will be monitored and documented.

## **Introduction of the improved jaggery making stove to the jaggery-making clusters in North Karnataka**

(Supported by Deshpande Foundation)

This project commenced in March 2007 and aimed to introduce jaggery-making stoves in the jaggery clusters of north Karnataka. The project was conceived for the introduction of the two-pan jaggery-making stove. The project in the year 2007 had created awareness among the jaggery unit owners about the two pan stove and also put up two demo sites at Parishwad and Nedagundi.

The start up phase took a little longer than expected as the two pan stove design was not readily accepted by the unit owners. The focus was then changed towards introducing the single pan stove in the area.

During the product promotion of the single pan stove the visitors found its functioning quite satisfactory and indicated an interest towards adopting these stoves. The project was then extended to the second year with an aim to promote the single pan stoves by conducting meetings and field visits.

Initially the owners were hesitant to invest the whole amount and needed an impetus to adopt the stove. TIDE tried to build financial linkages with local banks to make it easier for the unit owner to adopt the technology. Gradually, as the number of units increased, it was easier to promote the stove as more unit owners had started approaching TIDE to install the improved stove at their cost.

TIDE conducts regular meetings and site visits to promote the stoves and till date has constructed 10 new stoves. A meeting with various stakeholders including improved jaggery unit owners (potential and current), jaggery sellers, masons, constructing the jaggery stoves and field staff of other NGOs was held to get an understanding of the mindset of the unit owners and how better to target the unit owners. TIDE has currently trained 3 masons in the construction of these stoves.

The single pan jaggery stove has now been gladly accepted among the unit owners; TIDE will now look at developing various options of financial linkages and also try to promote the two-pan stove. The grantors have now indicated that we should look at promoting other TIDE products in the region as well. TIDE will make an assessment of its products and aim to promote them in the subsequent years.

## **Demonstration of the use of local resources to meet the energy needs of an electrified village in Karnataka**

(Supported by Science and Society division of the Department of Science and Technology) (Govt. of India)

There are several remote hamlets in Karnataka that are not electrified through grid power and which are unlikely to be electrified through grid power. TIDE has chosen to electrify one

such remote village in the Uttara Kannada district of Karnataka through the pico hydro technology.

The objectives of the project are:

- To provide adequate, uninterrupted and reliable power supply to meet the requirements of all residents in the village.
- To construct and train local people in the construction of fuel-efficient smokeless stoves for rural industry applications.
- To support local organizations in managing and maintaining the local energy resources and the infrastructure created.

The project has strong techno economic challenges and required a strong component of innovation. The village is located in region where there is a dense forest cover and cables have to be laid over a distance of 5 kms. The power to be transmitted is also low (10 kW) and so the power and voltage losses should be under 5% .The project is therefore proposing the use of non standard cables for power transmission and the use of transformers. The project team has carried out a socio economic survey and a detailed project report. Based on the DPR, the project has carried out vendor development and placed order for various equipment required. Village meetings have been held to inform the villagers about the project. Power generation is expected to start soon and power distribution a few months later.

## **The Ashden Awards for Sustainable Energy**

(Award Supported by the Ashden Awards)

TIDE was the recipient of the Energy Champion award of the Ashden Award for Sustainable Energy 2008. The agreement with the Ashden Awards says that the award must be employed for development of a distribution network for a new TIDE promoted for profit venture and other activities that support creation of a new stream of work at TIDE and to also promote the Ashden Awards at various platforms.

TIDE has utilized this award for the development of a new business plan for an organization whom TIDE would be strategically aligned with to create two mutually dependent organizations.

It is expected that the new organization would partially provide financial support TIDE in its activities especially relating to new product development, innovation sourcing and similar activities that are difficult to get funded through conventional funding mechanisms. In addition TIDE has also commissioned a market survey to obtain more information on the target market for its range of products. It has also interacted with the Central Power Research Institute to obtain a certification for the performance of some of the new products that it is expected to launch through this new initiative. The grant was also used to develop business skills in the organization.

TIDE realizes that it has won international acclaim because of the work done by its entrepreneurs. TIDE has also used the funds to assist entrepreneurs in their promotion efforts and to boost sales. It has supported the printing of brochures, participation in exhibitions, vehicle campaigns etc. which would also ensure that the Ashden awards are promoted among rural users of energy efficient products.

## **Support for E-Net Magazine**

(Supported by Practical Action)

In the past year TIDE has built a stable relation with Practical Action an international NGO with its South Asia operations headquartered in Colombo Sri Lanka. Practical Action and TIDE share a common vision of addressing the energy needs of poor communities. Practical Action has initiated a project called E-net to further this objective. E-net is a network of institutions and individuals promoting community based decentralized renewable energy (and approaches in implementing) to meet the energy needs of the poor. TIDE is collaborating with Practical Action in editing its energy-networking magazine and distributing it among interested audiences in India.

As a part of the project activities, TIDE has sourced three articles for e-net. Additionally Svati Bhogle is also the Editor in Chief of the magazine and has undertaken tasks like commenting on the articles received, editing the articles examining the layout etc. TIDE also looks after the circulation of this magazine in India currently to about 150 readers. It maintains a database of the organizations and individuals who receive each issue. It has extended the scope of its work recently to also include development of membership of e-forum, which is an electronic discussion platform on issues relating to energy needs of the poor. In the year 2008, three issues of e-net have been circulated.

## **Demonstration of fuel-efficient stoves in Madanapalle**

(Supported by Foundation for Ecological Security Madanapalle)

Foundation for Ecological Security (FES) is a non-profit organization that works for the ecological restoration of land and water resources. As a part of one its projects, FES Madanapalle had taken up the ecological restoration work in three mandals of Chittoor district falling in the Papagni river basin through participation of rural communities. One of the mandates of this project was the conservation of biomass resources. FES identified street food vendors and commercial kitchens as big consumers of wood in the region. FES approached TIDE to demonstrate fuel-efficient stoves that it has developed for this class of users and work towards ensuring their acceptability. It was decided that three types of stoves - dosa-making stoves, frying stoves and large cook stoves would be demonstrated in this collaborative project.

TIDE worked closely with FES, to understand the cooking energy needs of the target community, adapt the existing designs of stoves to meet the end user needs, construct and commission the stoves, assist FES in organizing users awareness camps and ensure that the end user was happy with the performance of the stoves.

TIDE constructed twelve large cooking stoves, thirty frying stoves and seven tava stoves in the region. Care was taken to ensure that the stoves occupied the same space as conventional stoves and were designed to meet the cooking capacities of the consumer. TIDE monitored the use of these stoves and calculated that each stove is saving the user about 50% of its firewood costs. The stoves have been accepted by the users and are offering them a cleaner, cooler and safer working environment. Additionally they are contributing to the reduction of carbon emissions. The scope for replication of this project is very high.

## **Smokeless Stoves in Gubbi Taluk**

(Supported by Mahatma Gandhi Regional Institute for Rural Energy and Development)

In an effort to provide an impetus to our household stove entrepreneurs, it was proposed to use the budget for support for stove builders under the ETC project to sponsor a pilot initiative of converting a village into a smoke free village. Smt.Katyayini, a stove entrepreneur of Gubbi taluk came forward to take up construction of Sarala stoves. She selected Yemmedoddi village in Gubbi taluk for the pilot initiative and converted it into a smokeless village. There are several social and cultural obstacles that prevent a few households from demolishing their old stove and getting a new stove built, therefore TIDE's criterion of a smokeless village was that, at least 80% of the households in the village should have a smokeless stove.

Based on the experiences in the above pilot initiative, Mahatma Gandhi Regional Institute for Rural Energy and Development (MGRINED), Bangalore sent a proposal to Petroleum Conservation Research Association (PCRA) for construction of smokeless stoves. PCRA has approved the project to build 1470 smokeless stoves. The sponsorship of these two bodies would be immensely important, as it would indicate government's endorsement for the smokeless village concept. MGRINED has given TIDE a grant to get the stoves built, monitor the construction and maintain data of stoves built.

Smt. Katyayini has begun building the stoves in her village of Shivasandra. The project has helped to build the capacity of Katyayini. She has organised the materials for stove construction on her own and arranged for them to be transported to her village. She has also understood the methods to approach households who hesitate to get a smokeless stove built.

### **Training conducted by TIDE in smokeless stove construction:**

In the earlier project funded by ETC, TIDE had developed a Technical Training package for construction of smokeless stoves. This package was used to train people identified by seven Zilla Panchayats of Karnataka under the IREP 2 years back. Master builders trained by TIDE as trainers conducted the training under the supervision of TIDE.

Enquiries for training in stove construction were received subsequently from several NGOs. Two NGOs - S3IDF, Bangalore and Laya, Vishakhapatnam agreed to give a grant to TIDE to impart technical training to members of their SHGs in the construction of smokeless stoves. Ms Katyayini trained 8 women and 2 men identified by Chaitanya (a partner NGO of S3IDF) in Nayakanahatti village in Chitradurga district of Karnataka. She used the training package developed by TIDE and conducted a 5-day training programme.

Due to barrier of language, the women trainers could not take up the training assignment organized by Laya. Hence the staff of TIDE conducted the 5-day training Session for 3 women and 2 men in East Godavari district in Andhra Pradesh. The trained persons have built forty two stoves according to the last report from LAYA.

## **HP Micro Enterprise Development Program**

(Supported by Hewlett Packard)

The HP Micro enterprise development program is an initiative to support development of micro enterprises by providing start-up assistance, business training, and advice to the entrepreneurs. This training is imparted through various organizations that are already working with entrepreneurs and micro enterprises. TIDE is one such organization selected to impart training to the micro enterprises.

The grant from HP includes computers, infrastructure for the training facilities and training in the Micro enterprises acceleration program (MAP) curriculum. The purpose of the MAP curriculum is to demonstrate how micro entrepreneurs can improve their businesses using technology. The training aims to help the micro entrepreneur to perceive the connection between common business challenges and technology solutions. The MAP curriculum exposes the entrepreneurs to a range of technology tools that might be helpful in their business.

TIDE was trained to impart the MAP curriculum at a 5 day ToT program. The instructor was trained in the use of techniques that facilitated participants to achieve maximum benefits from the curriculum. This exercise also helped in enhancing the communication skills of the trainer.

TIDE has set up a training centre with infrastructure for a batch size of 14 participants. The centre has been equipped with the laptops provided by HP. TIDE intends to train a hundred women in the MAP curriculum in the training center in the next year.

TIDE is interacting with various NGOs and organizations to identify potential trainees who could benefit from the training. The first training is expected to be conducted in the second/third week of January 2009.

## **School and community horticulture enterprise - Nutritional support for primary education**

(Support by Sir Dorabji Tata Trust)

The project area covers a cluster of ten villages in Tiptur taluk, Tumkur district, Karnataka State. The goal of the project is to demonstrate the potential of sustainable technology interventions in initiating social, economic and cultural transformation. The broad objective of the project is the capacity building of women with small land holding, in precision farming techniques and its acceptance as a livelihood, community involvement for augmentation of the nutrition content in the school mid day meal scheme and evolving a methodology for scaling up of this social enterprise.

An information brochure of the project has been prepared. This brochure contains information about the project activities and its outputs and was given to various Government departments inturn helping us building linkages with them.

Initially, the project team carried out a survey covering 40 villages in Tiptur taluk of Tumkur district and held discussions with 137 members of SHGs in May & June 2008. Based on the discussions, four members of four SHGs were identified using criteria like availability of land and water, willingness and ability to contribute towards the greenhouse, willingness to donate vegetables to the nearby school @ 50 gm per child per day (in addition to the vegetables being bought as a part of the mid day meals reported to be about 25 gm of vegetables per child per day).

After finalizing participation of the SHG members, the government primary schools nearest to the greenhouse were identified. TIDE project staff conducted meetings to explain the aims and objectives of the project especially the need for augmenting nutrition in the school with the following government officials:

- Joint Director, Mid-day meal scheme, Govt. of Karnataka
- Chief Executive Officer of Zilla Panchayat, Tumkur
- Education Officer, Akshara Daasoha of Tumkur District
- Block Education Officer, Tiptur taluk
- Director, Block Resource Centre, Tiptur taluk

Four greenhouses of 200 Sq.m area each with a provision for natural ventilation were constructed in the agricultural land of the identified SHG members. Pre-cropping activities like bed formation, soil preparation and soil fumigation were done based on inputs given by horticulture experts. Colored capsicum seedlings were planted in all greenhouses. The crops are regularly monitored by experts from GKVK and other consultants to ensure a healthy harvest. Market Linkages were developed by TIDE with Metro Cash & Carry, Bangalore to

whom the SHG members are selling the harvested capsicum at Rs. 35 to Rs. 40 /Kg. In the second year, six more greenhouses would be commissioned in different villages with the same objectives.

## **Capacity building of women for a greenhouse horticulture enterprise**

(Supported by GSRD Foundation)

This is a 21 month project and was sanctioned in March 2008. The main objective of the project is to carry out activities to demonstrate that a greenhouse based enterprise is a lucrative income generation option for a woman's group, to train other women in greenhouse horticulture and motivate them to adopt greenhouse horticulture and to spread awareness about the project among relevant agencies.

The project area covers two villages in the Tiptur taluk of Tumkur district in Karnataka State. The project team carried out surveys in various villages and identified one site for the current year in Eralagere village Tiptur taluk.

Smt.Kamamma W/o Shankarappa, a member of Shri Nandini Stree Shakti Sangha showed interest in this project. TIDE has constructed a naturally ventilated greenhouse of 500 Sq.m area with a rainwater harvesting system.

Training was imparted on all aspects of GH cultivation to the SHG members. Subsequently, the coloured bell pepper seedlings (C.Orebelle, C. Bombii) were planted in the greenhouse.

Technical inputs are being provided by Dr.Krishna Manohar, Principal Investigator, Precision Farming Development Centre (PFDC), Bangalore and Mr. J.B Manjunath, a GH entrepreneur.

Marketing linkages were developed with METRO, Bangalore. The SHG could directly sell their produce to the retailer at a fixed amount thereby guaranteeing profit to the SHG and avoiding the hassle of middle men.TIDE plans to develop linkages with potential individual / organisational buyers to establish a wider market for the SHG.

The project team plans to interact with NABARD office, Tumkur, Kalpataru Gramina bank, Tiptur and State Horticulture Department in the coming year to avail the facility of loan and subsidies for to encourage participation of the interested SHGs and progressive farmers to take up GH cultivation as an enterprise.

## **Creation of a rainwater harvesting facility at Nehru Planetarium, Bangalore**

(Supported by ADOBE)

This project is supported by Charity Aid Foundation (CAF) India on behalf of Adobe System India Private limited. The project is of one-year duration and started from November 2008. The project would function as a live demonstration of a rainwater harvesting system at the Jawaharlal Nehru planetarium premises on Raj Bhavan Road, Bangalore. The venue attracts about 2 lakh school children and would provide an excellent opportunity to educate young minds that may not have experienced water scarcity, about the depleting water table, its implication on the environment.

The Jawaharlal Planetarium, Bangalore is currently operating all its facilities for eg: cooling towers, flushing using potable water supplied by the BWSSB. With the commissioning of the rainwater harvesting facility, the BWSSB water consumption at the planetarium can be saved for potable purposes.

It is proposed to harvest rainwater from rooftops, paved and unpaved areas through various structures. The harvested water can be channelized through the existing distribution system, filtered, stored, and directed to recharge the borewells. It is estimated that the total quantity of rainwater harvested annually would be about 42 lakh liters (12 lakhs from rooftop and 30 lakhs from paved / unpaved areas).

Techniques of rainwater harvesting including rooftop rainwater harvesting, groundwater recharge, harvesting from un-paved area will be demonstrated. Prominent display boards and a small exhibition will highlight the systems adopted to instil awareness and understanding the needs / issues for conservation of rainwater among visiting children.

Presently, the rainwater harvesting plan is being discussed with BASE officials and Phase I has been approved. The project team has identified the contractors for implementation of the Rainwater harvesting system. High priority for safety of the children and visitors has been considered in the design development. The promotional / awareness materials are being prepared for distribution amongst children. Our project staff also attended the capacity building workshop organized by CAF and Adobe in Delhi in November 2008.

## **Rainwater Harvesting Projects during the Year 2008**

In the year 2008, TIDE provided the rainwater harvesting and groundwater recharging plans to Cadbury, Sansera and Essilor factories in Bangalore.

Cadbury India Limited (CIL) has a factory covering an area about 15 acres at Jodi Hanumanapallya, Kunigal 36 Km (NH 48) Stone, Mahadevapura post, Nelmangala taluk, Bangalore rural district, Karnataka State.

The factory management wanted to implement a rainwater harvesting system for the entire campus to conserve rainwater and augment groundwater resources. In this connection, Cadbury approached TIDE to carry out a study and prepare a feasibility report on the same. Subsequently, TIDE conducted hydro geological and geophysical surveys, yield tests (draw down and recovery) for the working bore wells and infiltration / percolation tests. The main objective of the study was to assess the existing water demand and supply, the potential to recharge using rainwater, and to prepare a plan for rainwater collection along with existing sources and recharge options.

All the data was analysed, assessed, and a report with recommendations was prepared and submitted to Cadbury for RWH implementation. TIDE RWH plans were implemented in the Cadbury campus.

### **Development of awareness on water conservation and planning / assessment of rainwater (Sansera Engineering Pvt. Ltd., Bangalore)**

This factory is located in the Bommasandra Industrial area, Bangalore. Sansera provided a grant for development of awareness on water conservation and planning / assessment of rainwater. Accordingly, various data was collected and analysed. The primary objective of this study was to understand the methodology for conserving and recharging the valuable rainwater resource that is unutilised. Various rainwater-harvesting structures were suggested to harvest rainwater incident on the rooftop and direct and indirect methods to augment ground water resources. The collected water would be used for non-potable purposes and / or for recharging the borewell. The rainfall data, drawings of recharge wells, recharge pits, filter unit, etc., and rainwater harvesting plan and groundwater recharging options were presented in the report, which was submitted, to Sansera.

### **Rainwater and groundwater recharging systems (Essilor Manufacturing India Pvt. Ltd., Bangalore)**

The Industry provided a grant to TIDE to prepare rainwater- harvesting strategy for Essilors Bangalore campus. The primary objective of this study was to understand the methodology for conserving and recharging the valuable rainwater resource that is unutilized. TIDE staff visited the factory premises and collected various data such as roof area, roof type, paved / unpaved area, groundwater discharge structures, water storage structures; water quality data etc., Groundwater level in the borewells was measured. Existing rainwater harvesting system was also studied. Subsequently, the data was analyzed and various drawings on rainwater harvesting and groundwater recharging structures were prepared. After discussions, the recommendations were presented in a report and submitted to Essilor for the implementation of the rainwater harvesting system in their campus.

### **Fuel-efficient Design and Development of Citronella Oil Distillation Units in Southern Western Ghats**

(Supported by World Wildlife Fund for Nature - India)

WWF is working in the Western Ghats of Coimbatore and Polachi area for the development of wildlife and forest in the area. The tribal communities staying in the interiors of these forest areas harvest citronella grass to produce citronell oil; the process involves distilling

the grass to extract oil. The community have developed a local oil-extracting device, which is similar to a baby boiler which has to be fired continuously to produce steam, this steam is sent through the grass and oil vapours in the grass are separated by condensation of steam. The firewood to produce steam comes from the forest. The process was monitored by TIDE and the findings revealed that process adopted for citronella oil was of very low efficiency, which resulted in consumption of large quantities of firewood for process heat. The novel solution was to redesign the existing device and provide a proper insulated combustion chamber with controlled air supply, which ensured that all the heat available in the chamber is used up by the distillation shell to heat the water and produce steam. In the improved device the water is separated from the grass to ensure that water gets evaporated sooner, than in the conventional device. Hence, the time taken for each batch is less and the yield of oil is more. The improved steam distillation device will be implemented in the field by the end of 2008 and tested during seasons when the grass is harvested.

## **Energy Conservation in Small Sector Tea Processing Units in South India**

(Supported by UNDP, GEF)

The project is under implementation since January 2008. A project inception workshop was held on 6th March 2008 in which 120 representatives from the Tea sector participated. Discussions were held with Anna University, Chennai to plan the implementation of energy audits in tea factories. 3 training programs were conducted in Kotagiri, Kundah and Gudalur regions for tea factory owners and technicians. During these programs, technical experts explained the relevance of energy efficient / renewable energy technology (RE/EE) in reducing tea processing costs. Awareness meetings have been held in Valparai and in Karnataka. Estate-sector is also showing interest in aligning with the project. Union minister of State for Power and Commerce Mr. Jairam Ramesh visited a solar installation site in Coonoor, which resulted in good media coverage.

Project brochure, pamphlet and presentations on energy conservation have been circulated to tea factories. Three newsletters have been released with articles on energy efficiency in tea factories. Project website was created. Preliminary energy audits have been completed in 152 factories (118 bought-leaf factories and 34 estate factories.) The data has been analyzed and findings shared with industry. A scheme for detailed energy audits in tea factories has been developed and launched. These audits have resulted in identification of energy conservation measures. Individual meetings have been held with these factories for discussion of the reports and preparing them for implementation of the recommendation. Data from the energy audits have been consolidated in a database. Investment grade energy audits are being conducted by an Energy Saving Company (ESCO). Data on wood (wood moisture, calorific value, types, inventory levels, source etc) used in the factories is being collected. Experiments have been conducted to demonstrate energy savings through use of high calorific value briquettes, and results shared with factories. A detailed database of suppliers of energy saving equipments to tea factories has been developed. Agreement with UPASI for setting up an energy lab and service centre in UPASI premises has been reached. Studies on wood-drying launched in Coonoor. Monitoring of solar air-heating in progress.

Banks have been contacted to review the terms for lending to adopt RE/EE equipment. An ESCO has been identified to review opportunities for debt financing of RE/EE equipments. The ESCO has undertaken Investment Grade energy audits and defined factory specific terms for lending and repayment. List of energy - efficient electrical equipment has been submitted to tea-board for inclusion in the subsidy scheme. Discussions are on with ELPRO Energy Dimension for setting up of an energy centre at Coonoor to address the equipment and finance needs of the sector.

Training programs have been organized for the project implementation teams. A program on energy conservation and management in tea factories, on-site program on conducting preliminary energy audits and, program on tea processing technologies have been conducted. All project staff have been exposed to data collection techniques during the detailed energy audits. The staff have also been trained by the auditors in identifying opportunities for energy conservation in tea factories.

TIDE, Anna University and UPASI - Tea research foundation come together to analyse energy consumption patterns in tea industries. The same team can offer similar services to other industries in the plantation sector in South India.

A project office has been set up in the premises of the tea board, Coonoor. MoU between Tea Board and TIDE for operationalizing their project activities has been signed.

## **Development and Dissemination of an improved Brick Kiln**

(Supported by Science and Society Division, Department of Science and Technology)

This two-year project sanctioned in November 2007 aimed at the construction and dissemination of five Low Capacity Brick Kilns (LCBK) in different parts of South India by TIDE in association with Gramvidya, Sidaganahally. The improved (design) of brick kilns was developed by Prof K S Jagadish and engineers from TIDE and it forayed into improved brick firing techniques to improve fuel efficiency, quality of bricks and their output number.

The project activities involved identification of sites for field-testing, field visits, construction of LCBK and its supervised operation and data collection. This year witnessed successful completion of three such LCBKs in the regions of Hiriyyur in Karnataka, Amalapuram in Andhra Pradesh and in Pondicherry. In all of the regions the target community was the segment of small-unorganized brick makers who currently operated on slender margins and with the LCBK could generate a profitable income.

The LCBK is constructed out of table-molded bricks, cement, sand, soil and some parts fabricated from mild steel. Capacity of each kiln is 12000 bricks per batch. The bricks are burnt in 4 levels and 3000 bricks can be stacked in each level. This updraft kiln, operates at a temperature range of 600-800oC and takes 48 -60 hours to complete the entire process of burning of the bricks.

The LCBK shows a fuel efficiency of 40% compared to the conventional clamp type kiln with a Specific Fuel Consumption (S.F.C) of 0.27 kg per brick; the investment in equipment and

working cost is low. The other salient features of the kiln include issues like minimization of rejects (unburnt bricks), operator comfort, and reduction of smoke.

The project faced problems in identification of potential users of LCBK. However, once the group was identified, training and commissioning of brick makers followed smoothly. Presently three masons have been trained in construction of the kiln. The owners of the LCBKs generate a fair profit from this enterprise as compared to conventional kilns due to the reduced rejection and fuel saving.

Expansion and awareness of the project LCBK still remain as the major agenda even after the completion of the project. TIDE has approached various gramina banks and other financial institutions to offer loans for interested set of small time brick makers who are not covered under the project, thus ensuring non-stagnancy of this art form of generations. The enthusiastic response from the brick makers using LCBK suggests the need for commercialization of the LCBK to help the small brick making enterprise.

## **Enabling energy-efficient entrepreneurship in a textile cluster in Tamil Nadu**

(Supported by G-Star Foundation)

Erode is a major textile cluster in Tamil Nadu because of availability of water throughout the year. The river Cauvery flows through Erode town. Most of the bleaching units are small scale units and the dyeing units are even smaller sometimes backyard operations. The district has 110 bleaching units, 130 dyeing units and 60 units that carry out both bleaching and dyeing. About 300 truckloads of firewood is traded every day in the Erode market. TIDE proposed a project to the G-Star foundation to initiate energy entrepreneurship for factory produced, off the shelf energy efficient products for a range of stoves in the textile cluster in Erode.

The project objectives were to create infrastructure and a distribution mechanism that would stimulate adoption of energy efficient equipment sector in Erode district and thus contribute to climate change mitigation. In the past year, the project carried out the following activities:

- Identification of fabrication units that would become producers of the energy efficient stoves that would be used for various activities in the region.
- Creation of a stocking cum servicing infrastructure in Erode for these products
- The project is on course to creating adequate stocks of different energy efficient stoves and water heaters to initiate energy entrepreneurship
- It has trained the local staff and other interest groups in installation, servicing, maintenance and troubleshooting.

- It is in the process of identifying sales agents who would support the local entrepreneur to sell these products in the project area.

The project has understood that the sector needs financial linkages that would offer an installment scheme for purchase of the products and is on course to developing these linkages. It has also invested in demo units around which a marketing campaign would be built up and sales could be stimulated.

The project, in the coming year, would then initiate sales and then deliver its environmental objective of reducing firewood consumption.

## **GHG emission reduction through use of energy efficient technologies by textile processing units in Tamil Nadu**

(Supported by UNDP-GEF under its Small Grant Program)

This project has created a sustainable entrepreneurship for fuel-efficient stoves in the textile clusters in Erode, Coimbatore, Namakkal and Salem districts.

In the first year of project implementation, the project focused on demonstrating fuel efficient stoves constructed on site for bleaching and dyeing operations. It further demonstrated the 100 liter and 450 liter water heater for a range of hot water needs in the cluster.

In the second and last year of operation, the installation targets of the project in terms of number of stoves constructed were delivered. Mr. Bal Murugan, the entrepreneur trained in stove construction, constructed over 100 stoves. Further Mr. Murugan has diversified his operations into other parts of Tamil Nadu and in Andhra Pradesh. Other support given to the entrepreneur included development of linkages with suppliers of stove components like insulation bricks, grates, linkages with transporters, masons, fabricators, etc. The project however encountered unexpected problems in delivering its commitment of the solar hot water systems because of sector specific constraints. The project also introduced briquettes into the sector by first analyzing the briquetting quality before recommending it to the textile clusters.

The project monitored the performance of the 100-liter water heaters and had their performance certified by the Central Power Research Institute. The efficiency of the 100-liter water heater was 54% compared to 16% of the conventional water heaters. A survey carried out by the project also assessed that the textile industries use water heaters for 348 days in a year. The carbon abatement potential of the water heater was 7.7 tons of CO<sub>2</sub> / yr.

In order to retain entrepreneur interest, especially at a time of severe stress for the textile industry, the project disseminated a new product the tava stove to make dosas for street food vendors and encouraged the entrepreneur to offer the same to maintain his profits. It has demonstrated acceptability of the fuel efficient stoves and a market mechanism to deliver the same. The project is now poised for replication in other textile clusters.

