Report 2009

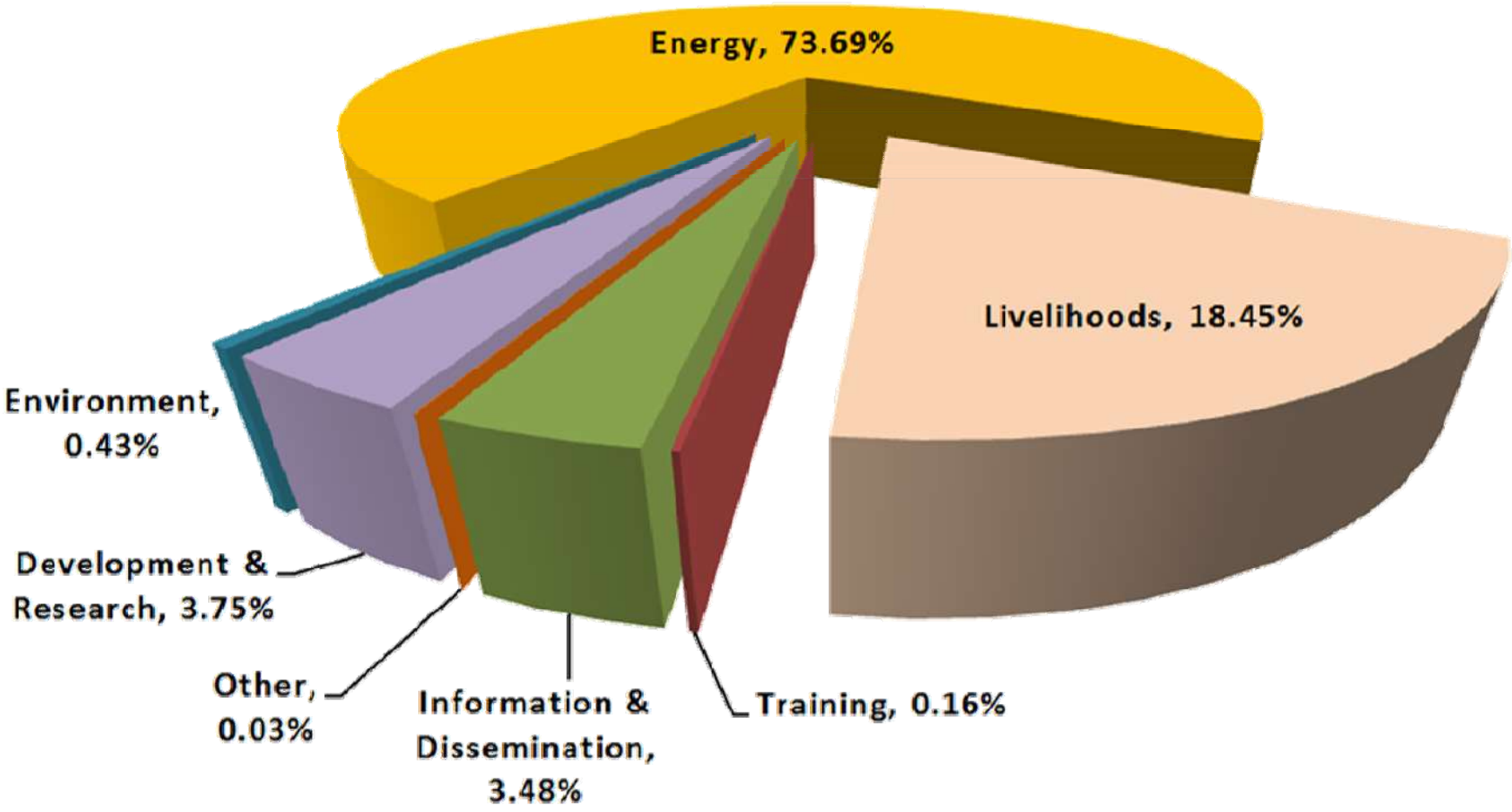
TIDE

Technology Informatics Design Endeavour

Catalyzing Change Through Technological Interventions

TIDE AT A GLANCE

Area-wise Project Expenditure



O V E R V I E W

The year in review has been very productive for TIDE, and it is noteworthy that several new directions, which have the potential to significantly impact our activities in the future, are being actively explored.

In terms of new initiatives, TIDE has progressed in exploring market mechanisms to achieve rapid and scalable dissemination of identified, energy efficient technologies and products, in certain identified geographies. A new company, Sustaintech India Pvt. Ltd. (SIPL), which builds on the past experience of TIDE, has been incorporated and has entered into arrangements with TIDE to act as a commercial vehicle for TIDE developed energy products and know-how. SIPL's business plans have received recognition and support from the investor community and the company is likely to obtain investments in the near future, which will enable the business to launch operations in the early part of the new year. SIPL has won the Rianta award in the "Emerging Entrepreneur" category at the Sankalp, Intellecap investor meet. It has also been identified as a New Ventures India finalist with support forthcoming for business plan development and for stimulating investor interest.

Another major initiative that is beginning to show results is TIDE's work on the UNDP-GEF supported project titled "Energy Conservation in Small Sector Tea Processing Units in South India", to promote the adoption of energy efficient products by the tea industry. The project is large and complex, with many stakeholders and several crucial points in the technology adoption phase. TIDE now understands how to work closely with the government and the industry and we hope that, in course of time, we would be able to evolve a successful model in public – private – civil society partnership for low carbon development. We are grateful to the Tea Board for their encouragement and support.

In addition to exploring new directions, TIDE continued its work on a variety of projects in the areas of energy efficient products for horticultural produce, low cost brick kilns, jaggery making units, citronella oil extraction units, and other applications. Some of these projects are also linked to women's livelihood and nutrition, in addition to having positive impacts on forest degradation and focusing on operating efficiencies of the units. Another areas of activity is water harvesting, wherein a large demonstration project has been implemented at the Jawaharlal Nehru Planetarium, Bangalore.

TIDE is currently in a state of transition. We are investing in capacity building of our staff and the internal discussions held on human resource policies are eliciting a lot of enthusiasm. In the past, the identity of TIDE has largely been that of a technology focused NGO. While trying to strengthen the same, we are also building capacities in other areas like training, awareness creation, documentation, social mobilization, innovative financing and monitoring. With competencies in all aspects of sustainable development, we are poised to achieve social impact through technological interventions.

We are grateful to our partners who have backed us in this transition phase. We are also grateful to all members of TEAM TIDE who enthusiastically participate in TIDE activities, often beyond the call of duty and with modest financial reward. I am proud to be associated with TIDE and look forward to taking it to greater heights.

N V Krishna

Chairman

TIDE

C O N T E N T S

Assessment of the impact of man-made modifications on the hydrological regime of the Varahi river basin, Karnataka

Supported by:

Department of Science and Technology (DST), New Delhi

Rivers are drying up at an alarming rate with devastating consequences for humanity, animals and the future of our planet. Water abstraction due to changing land usage patterns, sand mining and tourism in catchment areas, results in degraded water sources, vanishing tails, silted river beds, shrinking river channels and river courses running dry. Unfortunately, this is the case with many Indian rivers too. The construction of dams or other water holding structures in a riverine ecosystem, abruptly alters many physical and biological processes. To assess the influences of land usage and the effects of impoundments on the river system, measurements of possible variations in resources along the river course as well as upstream changes in natural conditions need to be considered. Despite several studies on human interventions on hydrological systems, in form of dams, roads, etc., much data is not available on Indian river basins. It is of essence to quantify and illustrate the current status of hydrological alterations of river basins, in order to identify inconsistencies in data and find ways to improve the quantification of water resources.

The proposed study measures and evaluates the changes in water resources as a function of cumulative impacts of human interference. Further, the type, magnitude and direction of hydrological shifts, due to impoundments and other man-made alterations to the river's catchment, will be documented. A model study of the Varahi River Basin Dakshina Kannada will be carried out using data on hydrological, meteorological and other parameters, which are available from secondary sources as well as the public domain.

The impact of hydrological shifts is studied using Remote Sensing (RS) and Geographic Information System (GIS) techniques together with hydro-meteorological data, to derive the status and trend of the stream flow / sediment response. Essentially, this study will create an understanding of various parameters and how they act together to define the hydrology of the river basin. The role of human interventions upon land and water resources over the past few decades, primarily upon features such as trends and constraints of the river, will be recorded. There is a notable absence of suitable information on the nature and magnitude of various human impacts on the river regime.

Thus, the proposed project work will address this knowledge gap, serving as a tool for large scale planning and forecasting. The conduct of this initiative and additional studies the like at different parts of the globe are required to generalize the impact of changes to the river. Planners, land managers and researchers can use the knowledge generated to address a range of issues relating to our land and water resources and the impacts of human activity on the environment.

TIDE

All India coordinated research project on biomass-based tray dryers

Supported by:

Department of Science and Technology (DST), New Delhi

This two-year research project, funded by the Government of India, concerns the usage of biomass dryers in different geographical regions of the country.

Loose fuel for dryers

The project objectives are:

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

The following NGOs in the sub-Himalayan region and in the North-east were identified for introduction to and demonstration of the biomass dryers:

INHERE, Almora; ATI, Ukhimath; CTD, Dehradun; STD, Mandi and Bethany in Shillong. All NGOs prepared proposals for the use of dryers to enhance the livelihoods of women in their regions. Each NGO identified various products to be dried such as apples, apricots, turmeric, etc. Guidance was given to each NGO for the calculation of techno-economic factors of each product, in order for them to include the same in their proposals. The proposals were collated and sent to DST for approval.

Combustion chamber for loose biomass

A combustion chamber with an attached hopper, to feed loose and light fuel (e.g. dried pine needles) into the dryer, was designed. Continuous fuel supply in the combustion chamber is ensured by the hopper with a piston arrangement. A sloping grate in the combustion chamber allows primary air to enter it and maintain the right air-fuel ratio, which ensures efficient burning.

The handouts form part of the technical training material and have been translated into Hindi, for use during technical training which will take place after the approval of the NGOs' proposals. Once the proposals have been approved of, a fabricator at one of the partner's sites will be trained to build the dryer with the hopper attachment. Subsequently, the NGOs will be trained in the use of the dryers.

Core Grant

Supported by:

Department of Science and Technology (DST), New Delhi

The DST review team had recommended a suitable combination of innovation and extension as the working mandate for the Core Grant awarded to TIDE. In keeping with this theme, TIDE used the grant for the development of new energy efficient biomass energy products, the development of training programs for the extension of work and for its outreach activities.

TIDE's Council of Management has in the past year incorporated a company that would explore a technology dissemination model for rapid adoption of environment friendly technologies. It has been proposed that the profits made by promoters of the company would be ploughed back into TIDE for furthering its activities. The Core Grant helped TIDE to depute the time of key personnel to strategize this evolution. Further, the Core Grant also enabled the stove-designing team to develop new products to be commercialized, the profits of which could be diverted to TIDE. Besides doing follow-up work on the development of the tava stove and the kadai stove, the team also developed and tested another product, a biomass kettle to prepare tea and coffee. These products have been field-tested and their performance certified by the Central Power Research Institute (CPRI). The design team also had to carry out other design related tasks involving cost and weight reduction, ease of transportation, reduction of wastage during production, adaptation of user comforts based on inputs from consumers, etc. Considering that these products were intended for commercialization, the team also developed documentation like warranty cards and user manuals, and interacted with the market development team to design promotional material. They also coordinated with the production partner for this venture.

As part of the extension activities, the Core Grant carried out awareness meetings with grassroots based Self-Help-Groups (SHG) and non-government organizations on the theme of sustainable agriculture, water conservation and tested training materials developed for grassroots entrepreneurship. The Core Grant team also interacted with financial institutions to understand issues related to financing rural technologies, especially the energy efficient products for rural artisans and the greenhouses for sustainable agriculture. Moreover, the Core Grant further enabled the development of new linkages, leading to project grants with first-time donor institutions like NABARD.

TIDE also used the Core Grant for capacity building of its staff by offering them training programs, largely in communication skills, as that was identified as an area of weakness. The website of TIDE has also been updated and maintained with core funds.

TIDE

Field-testing of low capacity brick kilns under different conditions

Supported by:

Department of Science and Technology (DST), New Delhi

Low capacity brick kiln

The Low Capacity Brick Kiln (LCBK) developed by TIDE with support from the Department of Science and Technology (DST) is one of the few technological interventions developed in the field of brick-firing. Brick being one of the most needed products, brick-making has developed from a small enterprise to a large scale profit making business. The small brick makers, who operate on a small scale and low profit margin, are largely scattered across India and use traditional methods of brick-making and firing. Traditional methods involve large amounts of brick wastage due to under firing and consume excess fuel due to over feeding and lack of knowledge about brick-making. The technology introduced by TIDE consists of a three-walled structure which acts as an enclosure for brick-firing. This helps in preventing heat loss due to radiation of heat to the surroundings. It also has a combustion chamber for calculated amounts of fuel-burning and air inlet pipes to supply the air required for combustion. The air pipes are located as such that the air supply is uniformly distributed across the kiln structure, allowing the quality of bricks to be uniform inside the kiln. It also prevents the brick from discoloring due to chocking, in case of lack of firing or smoking.

The kiln is designed to fire 12000 bricks at a time, while the fuel used to fire this quantity of bricks is 3 tons. The specific fuel consumption was found to be 0.25 kg of fuel per brick. The manpower required to arrange and fire these bricks is less than is required for the conventional kiln. The firing time is also less, the structure involves a fixed combustion chamber and eliminates back-smoking in the presence of air pipes, which supply the required quantity of air for combustion. The bricks are arranged inside the kiln by conventional methods and the open side, from where the arranging is done, is closed with mud through masonry work. While arranging the bricks, the chambers, which are made at intervals, are filled with fire wood. The chamber size and wood quantity are calibrated as demonstrated by TIDE. The bottom chamber is used for firing, which takes around 5 hours, after which the combustion chamber is closed with masonry mud work and left for 48 hours. The kiln is left to cool and the bricks are removed after 60 hours. The production capacity is around 48000 bricks per month. This new development uses roughly 40% less fuel than the conventional kiln does.

TIDE has installed 5 kilns in different states of southern India and the kilns are performing well, irrespective of the location and soil quality. Furthermore, the kiln is ready for dissemination. If any organization or individual wants to make use of this technological advancement, they are requested to contact TIDE.

Introduction of energy-efficient stoves to local entrepreneurs in North Karnataka

Supported by:

Deshpande Foundation

TIDE began its intervention in North Karnataka with the introduction of fuel efficient jaggery stoves. In the previous year, TIDE had sold only 20 stoves, but a sustained effort towards promoting the stove through meetings, vehicle campaigns, advertisements and wall paintings were instrumental in achieving the sales of more than 50 jaggery stoves in this year.

With the acceptability of the jaggery stove established, TIDE then introduced the khova stove in the region. The first demo at Thadakoda in Dharwad was well received. The new stove was more efficient than the conventional one, saving upto 50% of fuel. TIDE has installed 5 stoves in the region as demos. The users were happy with the performance of the stove, which was initially designed for large fuel. However, as the user wanted the stove to be compatible with loose fuel, the stove was modified to support the same. During discussions with the owner, it was found that one has to stop work for 2-3 days for installation of the new stove in place of the old one. The stove was then redesigned to have prefabricated components to reduce the time required for installation. A demo stove has also been constructed according to the new design and user feedback is awaited.

Khova-making stove

The other technology introduced in the region is the household cooking stove. Women are being trained in stove building. Seeking the assistance from NGOs in the area to identify women with an inclination to take up stove construction, TIDE intends to train about 50 women. TIDE has so far trained 35 women in the region.

The water heating stoves have also been demonstrated in the region and user feedback is satisfactory.

The project intends to stabilize the marketing of these products through entrepreneurs and introduce new ones in the region next year.

TIDE

To improve skills in women and children, enabling them to carry out sustainable agricultural practices

Supported by:

Anonymous

This 2-year project is being initiated with the aim of stimulating interaction between children, parents and school teachers, by creating an informal learning environment both for children and their mothers. The project is being implemented in Tiptur taluk.

Different activities are being carried out to improve confidence and skill levels among women. As a first step, training programs are taking place, enabling at least 4 women to conduct awareness meetings for school children and their mothers on nutrition, sustainable agriculture, environment and conservation of energy and water. In the process, they would also get involved in formal procedures at schools and children's education. They will also be trained on the engagement in sustainable agricultural practices and be encouraged to share the produce with the neighborhood's primary school.

Being the first year of the project, various meetings were held for 20 Self-Help-Groups (SHG) of Byrapura, Aralaguppe, Kallushettyhalli and Madlihalli villages of Tiptur taluk. A total of 146 women attended these meetings. The objective of the meetings was to identify women with the potential to conduct awareness and training programs for children and their mothers on environment, nutrition, cultivation practices, water conservation, etc. Based on the interactions, exercises and the questionnaires that the women filled in these meetings, 8 women were selected and trained on various topics and awareness creation. A second round of training was held to impart more information on water conservation. Further training will be offered on energy and environment conservation, sustainable agricultural practices and nutrition. Suitable awareness material is being prepared and given to the women. The women have also drawn a structured plan for the meetings that they will hold.

Conduct of training program

During the second year, the women will be trained on greenhouse horticulture. A greenhouse measuring 200 sq.m will be built in Aralaguppe village, wherein the trained women can cultivate high value vegetables and earn an income thereof. They will also supply vegetables to the local school.

At the end of the project, about 100 mothers, 300 school children and 25 school teachers from 5 schools would have enriched their awareness of important subjects such as environmental conservation. At least 4 women would be trained in awareness creation and will be running a social enterprise through greenhouse horticulture.

Micro-enterprise for rural women in the production of horticulture products dried in a biomass dryer

Supported by:

National Bank for Agriculture and Rural Development (NABARD), Bangalore

On the recommendation of DST, NABARD at Mumbai suggested that TIDE submit a proposal for the usage of biomass dryers. Accordingly, a proposal for the set-up of a women's enterprise for the production of dried vegetable products was put forward to NABARD, who chose to fund the project in two phases. The first phase would be a market survey, to assess the availability and potential of markets for dried vegetables. The second would be taken up, based upon the findings and results of the market survey phase.

The project's first phase lasts for 6 months and began in November 2009. The objective is to conduct a survey that determines the market potential of vegetable products such as onions, garlic, tomato, okra and bitter gourd, dried in a biomass dryer. The activities include production of samples of dried vegetables, certification of quality and shelf-life by a recognized laboratory and the conduct of a survey for households and institutional customers in Bangalore, Mumbai and Delhi. This is followed by an analysis of the results thereof. The survey has been carried out by Feedback Consulting, a market research consulting group. The samples have been produced by two groups of women in Puttur taluk, who have been trained in the use of the biomass dryer and are currently using it to dry coconuts and areca. The laboratory identified is IADFAC in Bangalore. A cutting machine to produce vegetable slices of uniform size, has been bought and installed on the premises of one of the Puttur groups. The survey has been completed in two of the cities.

HP Help Program

Supported by:

Hewlett Packard (HP)

TIDE identified APSA, an NGO that works with disadvantaged youth, empowering them through vocational training. The HP Microenterprise Training Program "Smart Technology for Smart Business (STSB)", was a complementary training program for the trainees of APSA, as they were about to go on a job search or start their own enterprise. TIDE conducted the STSB Training Program, for 2 batches of 32 trainees in total.

This year "The Graduate Entrepreneurship Training through Information Technology (GET-IT)" training program, targeted at improving the employability of youth with business and IT skills, was introduced.

TIDE trainers were trained to impart this training program at a TOT in Bangalore. A TIDE trainer was selected for the Master Trainer Training Program and is now a certified Master Trainer.

The GET-IT training was conducted with 32 trainees of an NGO, BREADS, working with trained rural youth, training them in various soft skills. The GET-IT training was aptly suited for these trainees. TIDE has also conducted trainings within 2 partner NGOs, one in Bangalore and the other in Kerala, working with youth and offering them vocational training. The GET-IT training was conducted for 37+ students.

TIDE

The construction of smokeless stoves and a workshop on smokeless chulahs for a smokeless village

Supported by:

Mahatma Gandhi Institute for Rural Energy and Development (MGIRED), Bangalore
Petroleum Conservation Research Association (PCRA)

Following fruitful experiences, the Mahatma Gandhi Institute for Rural Energy and Development (MGIRED), Bangalore put forward a proposal to the Petroleum Conservation Research Association (PCRA) for the construction of smokeless stoves in Gubbi taluk. PCRA approved of the project, for the construction of 380 smokeless stoves, in the first phase. MGIRED gave TIDE the grant to get the stoves built, to monitor their construction and to maintain data thereof. Smt. Katyayini, a stove entrepreneur, agreed to build the stoves; she was asked to select villages and render them smokeless.

Smt. Katyayini built 380 stoves in 5 villages, of which 3 have been converted into smokeless ones. TIDE's criterion for being considered a smokeless village, is that at least 80% of the households in the village should have a smokeless stove. The project has helped to build the capacity of Smt. Katyayini. She has developed certain criteria for the selection of villages where stoves are to be built and learnt to organize the materials for stove construction on her own. Further, her marketing skills have improved tremendously, as she has understood the art of convincing households who hesitate to get a smokeless stove built.

Workshop on Smokeless Stoves

Post completion of the first phase, involving the construction of smokeless stoves, PCRA funded a workshop on smokeless stoves. The objective of the workshop was to encourage the adoption of clean and energy-efficient biomass-burning stoves, promoting energy, security and clean indoor air in rural households and simultaneously avoiding the usage of kerosene for cooking. The experiences of TIDE, MGIRED and other organizations in the dissemination, use and feedback of smokeless stoves, were presented. The way ahead for smokeless stoves and the involvement of other stakeholders were also discussed. The Envirofit stove and the BP stove were also demonstrated. The users who attended the workshop felt that the stoves were too expensive for them. However, they felt that if offered a loan from a microfinance institution, they would consider buying a stove.

Training conducted by TIDE on the Construction of Smokeless Stoves

The technical training package developed in the earlier project funded by ETC, continued to be used to train women in stove construction. TIDE trained 5 women in Kanakapura, identified by an organization called Namana, in the construction of stoves.

Inauguration of "Smokeless Chulahs to save Kerosene"

Women's entrepreneurship for domestic lighting systems

Supported by:

United States Agency for International Development (USAID)
South Asia Regional Initiative (SARI)

USAID / SARI Energy has sanctioned a one-year project with the objective of building at least 6 women's enterprises for energy efficient household lighting, prompting rural households to start using low-cost, low-energy-consuming lights. The women set up enterprises by conducting awareness meetings in the villages about energy efficient lighting systems. The project is being implemented in Gubbi taluk. Abhivruddi, a grassroots NGO working in the region, is assisting TIDE in the identification of women and in arranging the logistics of training programs.

Groups activities during training sessions

During identification, Abhivruddi first found about 72 women, using a questionnaire developed by TIDE. Micro-Enterprise Development (MED) training was conducted for these women. Then, based on their performance, women who have the potential to run enterprises were identified. The training revolved around the curriculum developed through the ETC project. The training covered basic aspects of micro-enterprise-marketing, accounting and of planning a business. It also covered soft skills like communication, self-confidence and SWOT analysis. Activities, games and exercises were some of the training tools used. Based on the performance during the training, 12 women were selected as potential entrepreneurs. They will be further trained on conducting awareness meetings and on energy efficient domestic lighting. Electricity is supplied to rural regions of the state for merely 6-8 hours in a day. Hence, to reduce the dependence on electricity, energy efficient lights were identified. These can work either with electricity or on solar powered batteries. In support of this, CFL and LED lamps that consume less electricity will be promoted.

An attractive package for energy-efficient domestic lights will be created, which the women can use for their awareness meetings in the villages. As observers, TIDE will attend the awareness programs conducted by each woman during the project period, to boost her confidence and to offer her additional suggestions for improvement, if required. Eventually, they will collect orders for the lights from people who have come to attend the awareness program. To support the trained women in setting up and operating a micro-enterprise, TIDE will procure samples for demonstration. They will also help the women to develop and implement marketing strategies for the devices. TIDE will assist the women in becoming registered agents of their region for the energy-efficient lights. They will have a sustained market as well as a continuous and assured supply of devices against the orders that they receive.

The project will result in better use of lighting, which in turn leads to improved social development through enhanced safety and security. Efficient lighting will also lead to an increase in the time spent on studies, which in turn will improve the standard of education. The project will thus bring about a change in the standards of living and create new opportunities for rural people.

TIDE

Creation of a rainwater harvesting system at Bangalore Association for Science Education (BASE) premises

Supported by:

ADOBE India Ltd. Pvt.
Charity Aid Foundation (CAF), New Delhi

The project on the creation of a Rainwater Harvesting (RWH) facility installed at Bangalore Association for Science Education (BASE) is an excellent model of joint efforts. Design and implementation of the project were managed by Technology Informatics Design Endeavour (TIDE, Bangalore), while funding partner ADOBE India Pvt. Ltd. and facilitating partner Charity Aid Foundation (CAF) helped make it a success.

This project, at the Jawaharlal Nehru Planetarium (JNP) on Raj Bhavan Road in Bangalore, serves as a live demonstration of a RWH system. The venue attracts annually about 2 lakh school children and provides an excellent opportunity to educate young minds who may not have experienced water scarcity or depleting water tables and their implication on the environment.

The RWH system at JNP harvests all rainwater incidents on the 7-acre campus, for landscaping and non-potable use. All techniques of RWH, including rooftop RWH, harvesting from paved / un-paved areas and groundwater recharge, have been demonstrated. The recharge structures include trenches, pits, wells and an unlined rainwater pond. Water that overflows from the storage structures, is directed to groundwater re-charging structures.

Another important water conservation method adopted, is the redirection of air-conditioner-rejected water to a recharge well, mainly to recharge the aquifers and also to reduce the load on the sewerage system.

Presently, harvested rainwater is being used for landscaping, toilet flushing and other non-potable use. The harvested rainwater is also used to run a fountain - a novel application of rainwater for decorative purposes. With this water harvesting infrastructure, the JNP has the potential to harvest about 42 lakh liters of water per annum.

Furthermore, prominent display boards placed at the planetarium, highlight the details of the systems implemented, in order for visitors to be exposed to such techniques and learn thereof. Water harvesting and conservation slogans are displayed on campus to communicate the importance of water saving methods. For wider dissemination of this subject matter, information booklets in Kannada and English are available in the bookstore at the JNP. In addition, a flash presentation on RWH techniques was created, to explain its vital concepts as well as groundwater recharging methods.

Visitors are collecting the brochures, charts and CDs, which they can further make use of at schools, to spread knowledge on water conservation.

Harvested rainwater running a fountain at JNP

Fuel-efficient design & development / modification of citronella oil distillation units in the south-western Ghats landscape

Supported by:

World Wildlife Federation (WWF)

The practice of citronella oil distillation is being followed by the residential Adivasi community of the Western Ghats since the past five decades. The process of oil distillation uses a steam generation unit and a condenser. The steam generation unit consists of a shell with an inlet to feed water and dried citronella grass. The heat is passed through the bottom of the shell, steaming the water in the drum. The steam travels through the grass, while the oil extracts from the grass are collected and carried along with the steam. It subsequently passes through the condensation chamber, where it is cooled and liquefied. Eventually, the oil and water are separated in a fractional distillation drum.

Citronella oil distillation unit

The conventional method of oil distillation involves traditional practices and there is no technological intervention to check the oil quality or fuel savings. The Adivasi community works with a small profit margin and hence a cost effective technology was developed by TIDE. It delivers better output for the same grass capacity and reduced fuel combustion, through a more friendly practice. Since the development of the improved technology, the livelihood of the Adivasi community has been enriched. They get more value for the citronella oil produced, due to improved oil quality with reduced carbon content, while the process of charring grass in the shell has been completely eliminated.

The improved steam distillation unit has five parts:

1. The steam generation unit with an insulated combustion chamber
2. The pre-heater which also acts as a pre-condenser
3. The heat exchanger
4. The carbon filter
5. The main condenser

The device is designed according to the conventional one, so as to not divert the user from his accustomed user practices. The reduced fuel usage results in less drudgery to the people in collecting biomass, while increased yield for the same grass quantity results in more income for the same labor input and efforts. The citronella oil yield increased by 40%, the biomass saving was upto 50% for the same unit capacity and the quality of the oil was found to be superior, using the improved device.

TIDE

Energy conservation in small sector tea processing units in South India

Supported by:

United Nations Development Program (UNDP)
Global Environment Facility (GEF)

TIDE conceived this project with inputs from the Tea Board, UPASI and the Bought Leaf Association, supported by UNDP-GEF. The project objectives are to enable the tea sector in South India to transition to energy efficient options, while simultaneously reducing energy bills. This would also allow the sector to cut down CO_2 emissions and contribute to India's emission reduction plans. The approach adopted for project implementation is to first identify barriers to energy use reform, through carefully evolved processes, and to then develop strategies to reduce / eliminate them.

The barriers identified in the pdf phase were information, technology, finance and other sector specific ones. In this year, the project addressed issues of financial constraints, technology and information. The latter has largely been addressed through awareness creation meetings, distribution of newsletters, updation of the website and other communication platforms. Feedback from the tea industry indicates that such mechanisms have worked well and that the sector is comfortable with this approach. Some of the meetings organized include the buyer & seller meets, an International Tea Convention, seminars on renewable energy options in the tea sector, awareness programs on energy conservation and visits to tea factories.

For energy use reform, the preliminary energy audits were followed by detailed energy audits, conducted on a cost sharing basis between the project and the tea factories. ELPRO Energy Dimension has performed energy audits and also implemented post audit recommendations. Two different strategies for adoption - the guaranteed savings model and the ESCO model - were offered. In this year, 50 such energy audits were conducted and proposals for implementation were sent to concerned factories. Two model tea factories for energy efficiency were also created, expecting other factories to adopt the recommendations upon seeing the impact achieved in the model factories.

The project mandate has been to address both thermal as well as electrical energy use. The most feasible intervention for reduction in biomass consumption is the use of dry fuel and biomass briquettes of high calorific value. The project has made several efforts in this regard, including the administration of a complete survey of briquette manufacturers and research on the availability of loose biomass. It is now in the process of motivating the tea industry to set up its own briquetting units.

Furthermore, the project conducted surveys on the potential of solar air heating and hydro power generation. It is actively interacting with the Ministry of New and Renewable Energy (MNRE) for the set-up of demo units in the sector. The project also set up an UPASI Energy Service Facility, equipped with monitoring and metering equipments and offering testing and analysis facilities to the sector. The project interacted with technology providers and equipment suppliers, inviting them to participate in project activities. In the coming year, the project will make every effort to increase adoption of energy efficient technologies and explore financial interventions for the same.

School and community horticulture enterprise; nutritional support for primary education

Supported by:

Sir Dorabji Tata Trust (SDTT)

The project started in March 2008, with the aim of demonstrating the potential of sustainable technological interventions by initiating social, economic and cultural transformations. Main focus is on building the capacity of women with small land holdings, with regard to sustainable farming techniques and its acceptance as a livelihood. Further of great importance, is community involvement in the augmentation of nutritional content in the school mid-day meal scheme and evolving a methodology to scale up social enterprises.

Greenhouse for cultivation of crops

In the first phase, five newly constructed greenhouses, set up for the Self-Help-Groups (SHG), generated an additional income of roughly Rs. 20,000 from the first crop. The greenhouses are now ready for the planting of the second crop. The vegetables, supplied by the women to the schools, enhanced the nutritional content of mid-day meals of 267 school children.

Awareness meetings on the social enterprise were conducted for various stakeholders, viz. schools, SHGs, banks, horticulture department officials and panchayat members. Training courses were provided to 50 women on the maintenance of greenhouses and the cultivation of crops therein. Linkages are being developed with financial institutions, in order to obtain loans for the enterprises.

In 2009, the focus of activities was on the identification of new SHGs and the development of linkages with local banks and crop specialists. In addition, crop health in the existing greenhouses was monitored, while market linkages were developed for the sale of the produce to the urban / local markets.

A workshop for the SHG members was carried out on cultivation practices, disease and pest control in the greenhouses. Interactive sessions were conducted using activities, power point presentations and handouts. Training was also held on related strategic subjects such as planting, flowering, harvesting, security of crops and data collection.

An International Conference on Horticulture was held in Bangalore between the 9th and 13th November 2009. The project concept was accepted to be showcased at this event in form of a poster titled: “Greenhouse production of vegetables as a viable option and a nutritional support to primary school children in rural areas.”.

TIDE

Development and introduction of training courses in biomass-based drying technologies

Supported by:

ETC, Netherlands

During the first year of this 3-year project, capacity-building within TIDE's team was completed. The TIDE team attended various training courses to strengthen pedagogy and Micro-Enterprise Development (MED) concepts. A workshop on "communication with rural women" was held, to understand how to render communication and interactions with rural women more effective.

During the second year of the project, two training packages were developed – one for technical training on the use of biomass dryers, and the second on MED training. Each training package consists of a trainer's manual and handouts for participants, as well as of training material like slide shows, films, charts, exercises and games. The technical training package additionally includes a reference guide for trainers on biomass dryers.

Four Self-Help-Groups (SHG) were offered technical training on the use of biomass dryers and MED training. The training of these 4 groups essentially tested the effectiveness of the two training packages in terms of content and duration of the modules. They were by and large found to be very satisfactory.

Women using coconut dryer

Following a brief period of trial production, the groups set up enterprises in biomass drying. Different groups are using the dryer to dry various biomass products such as prawn, fish, areca, coconuts and jackfruit. These groups have also earned considerable profits by the sale of multiple kilos of their dried products.

Women undergoing technical training

In addition, TIDE's MED training has been further used to train 64 women under another package of TIDE. The technical training packages will also be used to train NGOs in the "All India Coordinated Research Project on Biomass Dryers".

TIDE's team of 6 trainers has shown considerable improvement in pedagogy. Individuals have learnt to use various training methods and tools to ensure that the training is participative. Moreover, capacity-building of TIDE's team is being planned, so that they learn more tools and methods, to reinforce some of the soft skills required to make training effective. The project is now nearing completion and as part of the project documentation, a film to demonstrate the training capacity of TIDE and the impact that it has made, is planned for production.

Capacity-building of women for a greenhouse horticulture enterprise

Supported by:

GSRD Foundation

This project commenced in March 2008, with the objective of demonstrating that a greenhouse based enterprise is an attractive option for income generation. It targets women's groups in rural areas, with the intention of training them in greenhouse horticulture and motivating them to adopt such practices and spread awareness about the project among relevant agencies. This project covers two villages in the Tiptur taluk of the Tumkur district in Karnataka state.

Experts monitoring cultivation of pole beans

In the year 2008, a greenhouse of 500 sq.m. with a rainwater collection system was constructed in the Eralgere village in Tiptur taluk. Shri Nandini Stree Shakti Sangha is maintaining the greenhouse enterprise.

Training was provided on pre-cropping activities such as the preparation of land for cultivation, soil fumigation, etc. Colored capsicum (red and yellow) were planted in the greenhouse and the yield from the first crop was 1039 kg, which generated an income of Rs. 17,000. This profit was gained from a marketing linkage developed between the Self-Help-Group (SHG) and METRO Cash & Carry, Bangalore. The yield of the colored capsicum was low in comparison to the estimate of 1500 kg. The profitability has also not been as expected, due to market factors.

Around 60,000 liters of rainwater were harvested from the rooftop of the greenhouse, sufficient for 48 days. This, in turn, reduced the pressure on the groundwater aquifers and the energy required to pump out the water. The drip system has effectively been utilized as a point source of irrigation, to ensure that the right quantity of water reaches the plant.

The second crop was that of colored capsicum, but due to certain abnormalities, the crop didn't produce the expected yield. The SHG has now prepared the greenhouse for the third cropping and, on the advice of experts, pole beans have been cultivated as a rotational crop. Pole beans mature later than regular beans, but can be produced over a longer period with a larger yield of beans. Growing beans vertically, allows the farmers to grow more beans in less space, which also facilitates harvesting by hand. Frequent harvesting and the removal of any mature beans, allow the plant to continuously produce new beans. Pole beans has a demand in urban and rural markets, thereby ensuring good prices.

NABARD and Kalpataru Gramina banks have agreed to provide the facility of loans to encourage participation from interested SHGs and progressive farmers. Once a suitable SHG is identified to take up an enterprise as a new venture, the construction of another greenhouse would commence under this project. TIDE will keep its efforts strong by constantly developing market linkages to establish a wider market for SHGs.

TIDE

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

Supported by:

United Nations Development Program (UNDP)
Global Environment Facility (GEF)

This project, which commenced in September 2006, was completed in July 2009.

The project objective was to create a local sustainable network to promote and disseminate energy efficient / renewable energy technologies for various segments of the textile industry.

A local network was created and is functioning smoothly. It delivers energy efficient wood burning products to the textile sector. To a limited extent, the network has also demonstrated its capacity to disseminate fuel efficient stoves for the street food vendor sector. The entrepreneur has commercially sold about 100 stoves during the project period.

The project also intended to install solar water heating systems, which could not be done due to sector specific problems. However, the project has instead installed a 450 liter biomass fired water heater and a 100 liter water heater, products that could result in similar energy savings and comparable GHG emission reductions.

Diversifying into other energy efficient products like the tava stove, the water heater in the same region has retained the interest of commercial networks, especially during the recession in the textile industry. Achievements include testing the products in field locations and establishing the acceptability of the products.

The entrepreneur, his team and the network elements benefited from expansion into a green business and deriving both profits and goodwill through this enterprise. The entrepreneur had a turnover of Rs. 800,000 during the project period and it is estimated that he made profits of Rs. 200,000 during the project period. The project created an additional 2500 person hours of work for the construction of stoves and therefore additional income for the supplier networks. The end users of the stoves derived economic, social and health benefits. Each stove installed is estimated to have saved its recipient Rs. 50,000 annually in fuel costs. The 100 stoves installed in the project are thus reducing energy costs of the beneficiaries by Rs. 5 million annually. Every textile unit employs an average of 20 workers, to carry out tasks like bleaching and dyeing. The 100 stoves installed offer a safer and healthier working environment because of reduced exposure to smoke by the workers. The stoves have thus contributed to the reduction of work place hazards.

The project has resulted in higher awareness of environmental issues, especially of the relation between good health and a clean environment. It is estimated that each stove installed has contributed to a reduction in firewood consumption by 25 tons per annum. The 100 stoves installed are conserving 2500 tons of firewood annually. This is equivalent to 3750 tons of CO_2 per year. The life of each stove is estimated to be 5 years, with minimal maintenance requirements.

Use of the 2008 Ashden Energy Champion Award

Supported by:

Ashden

The Ashden Award grant continued for the year 2009 as well. As detailed in the use of funds to the Ashden Awards, TIDE used the funds to carry out all preliminary work towards the incorporation of Sustaintech India Pvt. Ltd. (SIPL) as a for-profit company. The rationale behind the conceptualization of SIPL was primarily to achieve a large scale economic, environmental and social impact, evolving a technology dissemination model for the rapid replication of renewable and energy efficient technologies and also to build a sustainability plan for TIDE.

Some of the start-up activities towards the creation of SIPL:

• Market survey carried out by Feedback Consulting to estimate the market potential for industrial stoves in the state of Tamil Nadu.

• Development of a business plan for SIPL. This business plan was assessed to be the “Best Business Plan” in the ”Emerging Green Energy” category by Sankalp Intellecap, and received the Rianta Award. Subsequently, the business plan was selected by New Ventures India for financial mentoring.

• Assessing the non-renewable biomass used by street food vendors and estimating the amount of carbon dioxide conserved by SIPL in its 5 year planning period.

• Networking for consumer finance and marketing linkages. As a result of this the IFMR trust has developed a loan product for the stoves and marketing linkages are in place with RENE, Thanjavur and Adharam Trust, Madurai.

• Agreement for stove production and transportation with JSK Technologies including warranty support.

• Sanctioning of an interest-free loan of Rs. 25 lakhs for SIPL, from Villgro.

• Identification of and advanced stage of discussion with a consortium of investors. Development of promotional material for SIPL products.

In addition to the start-up activities for SIPL, the award grant also supported existing entrepreneurs with market development support and a course in social entrepreneurship at INSEAD for Svati Bhogle.

TIDE

Demonstrating the use of local resources to meet the thermal & electrical energy needs of an unelectrified village

Supported by:

Department of Science and Technology (DST), New Delhi

Medhinighatta is a remote unelectrified village in the Western Ghats. It has been untouched by development and there is no livelihood activity other than agriculture. The community also cannot engage in any other income generation activity because of no access to electricity or markets. The project is located in the remote hills of the Western Ghats, 4-5 kms from the state highway 48. The village is too remote to ever be electrified through grid power. The project would enable a remote village access to grid quality power and improve its ability to avail and use the latest technological developments dependant on electricity. This would improve options and living standards and solve societal challenges in a sustainable way.

The project is developing a unique structure of electricity supply for small powers and used the micro-hydro power available to the village at a distance of about 5km for supply of electricity to the 40 odd households at a total power of 12kW. The conventional option of using overhead cables is not possible. The proposed project is using a system of increasing the voltage from 3 phase 415V to 3 phase 830V at a generation point, using a transformer. The total system has been designed to ensure minimum energy loss, high safety and reliable power supply. The total set of design and installation package would be useful for other similar projects and contribute to the advancement of knowledge on the subject, enabling access of electricity to more such locations. Hence, the project demonstrates that it is possible to generate and distribute power to remote locations in dense forests using innovative technology.

The project would involve the local community in all project activities starting from civil works and commissioning. The project has had meetings with the village community, with women's groups and with the panchayat. It has obtained a written invitation from the panchayat to carry out the project with their support. The site has hydro power potential and this was the basis to use the technology. The pelton wheel has been adopted, due to the high head available. Induction motor as generator with self-excitation has been used instead of a synchronous motor, to ensure potential for local repairs and minimal maintenance. The transformers, armored cables and the panels to manage and monitor the use of power, have been designed for necessary safety and minimum power loss.

The major development in this project is to adopt the conventional technology used at large scale, for a small scale power plant. This development would provide access to a large number of sites for hydro power development in hilly terrains.

Human Resource Profile

Mr. N.V. Krishna
Chairman

NVK graduated from IIT Madras and IIM Calcutta and worked with Prof. A.K.N. Reddy at the Karnataka State Council for Science and Technology (KSCST). He has an abiding interest in the application of science and technology to contemporary global issues. He worked with IDL Chemicals Ltd. and as a Vice President (US Operations) and Head of Software Quality for Sonata Software. He is currently Director of Microsense and is also part of the Wireless City Project creating connected communities.

Ms. Svati Bhogle
Chief Executive Officer and Secretary

She holds a Masters Degree in Chemical Engineering from IIT Bombay. She worked for the Hindustan Lever Research Centre after which she turned to research in technology for development. When working for the Karnataka State Council for Science and Technology, she was involved in research and development of fuel-efficient biomass based stoves and dryers. In 2006, she was nominated for the Social Entrepreneur of the Year Award, jointly with the Founder Chairman of TIDE, Dr. S. Rajagopalan.

Mr. Murtuza Khetty
Chief Operating Officer

He is an MBA graduate from ENPC School of International Management Paris. His areas of interest are entrepreneurship and enterprise management, with strong focus on financing strategies. He manages the accounting and administration related functions at TIDE, in addition to coordinating training activities.

Dr. G.G. Chandankeri
Head, Water Technologies Group

He holds a Doctorate in Geology from Karnatak University Dharwad. His main areas of work are Geographic Information Systems (GIS), Remote Sensing (RS), ground water exploration and the design of rainwater harvesting and groundwater recharging structures. He heads the Water Technologies team at TIDE and is currently involved in developing innovative solutions for water management in rural, peri-urban and urban areas.

Mrs. R. Prabha
Head, Women & Livelihoods Group

She is a Post Graduate in Botany and has worked with LIC. She was a coordinator at the Center for Budget and Policy Studies. She currently heads the Gender and Livelihoods team and manages projects relating to the development of rural enterprises for self-help groups (SHG) of women.

Dr. V. Jayasree
Project Scientist

She holds a Bachelor's Degree of Science in Mathematics, as well as a Master's Degree of Science in Meteorology and a PhD in Meteorology from Cochin University of Science and Technology. She is currently working on water and environment management at TIDE.

Mr. Deekshith
Project Manager

He is a Mechanical Engineer from Adichunchungiri Institute of Engineering, Chikmagalur. At TIDE, he is the team leader of the Renewable Energy Technologies team. He has developed several innovating designs for biomass combustion products.

TIDE

Human Resource Profile

Mr. H.V. Abhishek
Project Engineer

He is a Mechanical Engineer from KVGCE Sullia, Karnataka and is a member of the Renewable Energy Technologies team at TIDE. His area of interest is design of biomass energy systems.

Mr. Manjunath H.C.
Project Manager

He holds a Master's Degree in Geography from Bangalore University. He coordinates field activities of TIDE in Tiptur taluk. He specializes in developing awareness and training programs.

Mr. Prakash D.S.
Project Manager

He is an Electrical Engineer from BDT Engineering College, Davangere. He is a member of the renewable energy technologies team of TIDE. He also coordinates the field activities of TIDE.

Mr. Vasanth Patil
Project Executive

He is a field supervisor and associated with awareness creation, market development and promotional activities for biomass energy devices.

Mr. Ajay V. Kumar
Project Engineer

He is a graduate from Acharya Institute of Technology, Bangalore, and holds a Bachelor's Degree in Mechanical Engineering.

Ms. Asha Ramaswami
Project Documentation

A Bachelor of Business Management, she also has experience in Corporate Communications. She assists TIDE with documentation processes.

Mr. Pallav Jhawar
Project Engineer

A graduate from IIT Bombay, he holds a Bachelor's Degree of Engineering in Metallurgical Engineering and Material Science. He assists commencement of field operations for the launch of energy efficient products in a for-profit mode.

Ms. Vijeta Hegde
Project Engineer

A graduate from Acharya Institute of Technology, Bangalore, she holds a Bachelor's Degree of Engineering in Bio-Technology. She works for water resource and greenhouse management.

Mr. Raja K.
Project Executive

He has 15 years of experience in TIDE. He looks after all field installations of TIDE products and their monitoring. He is a member of the Water Technologies team.

Mr. A. Krishnamoorthy
Project Executive

He holds a diploma in Mechanical Engineering from NPA Centenary Polytechnic College, Kotagiri. He is actively involved in the project for GHG emission reduction.

Ms. Nazly Frias
Management Trainee

She is a graduate from the Libre University of Colombia and holds a Bachelor's Degree in Law. She assists the set-up of field operations for the launch of energy efficient products in a for-profit mode.

Human Resource Profile

Mr. Vasanth Kumar
Project Executive

He is a Bachelor of Arts graduate from Bangalore University. His main interest is in activities related to livelihood generation. At TIDE he coordinates field activities and organizes training programs.

Mr. Nagula Kumar S.
Project Executive

He holds a Diploma in Mechanical Engineering from the State Board of Technical Education and Training, Tamil Nadu. He has a HSC from the Government Hr. Sec. School Yedappalli of Coonoor.

Mr. Jayaprakash
Project Associate

He coordinates the field activities of TIDE in Kerala. He is a member of the Women & Livelihoods team. He also does technical and enterprise training for TIDE and assists women's groups in finding markets for their produce.

Mr. Radhakrishnan N
Project Engineer

He holds a Diploma in Electrical and Electronics Engineering from the State Board of Technical Education and Training, Tamil Nadu. He heads the Tea Project team and facilitates the organization of various awareness programs of TIDE.

Mr. C. Sudharsan
Project Executive

He holds a Bachelor's Degree of Science in Electronics from SNR Sons College, Coimbatore. As a member of the Tea Project, he has a keen interest in energy conservation related aspects in the tea industry. He assists surveys, data collection, performance monitoring and equipment procurement.

Mr. Manigandan S.
Project Executive

He is a field supervisor and holds a Diploma in Mechanical Engineering from the State Board of Technical Education and Training, Tamil Nadu. He has extensive expertise in biomass and briquetting and is in charge of relations with briquetting machine suppliers and manufacturers.

Mr. Vikash A.
Project Executive

He holds a Diploma in Mechanical Engineering from the State Board of Technical Education and Training, Tamil Nadu. As a member of the tea project, he is involved in the PEA and DEA surveys as well as in data collection and compilation of solar surveys and wood experiments.

Mr. Jayaraman S
Accounts Manager

He is a Commerce Graduate from Bangalore University. He has been managing the accounts department of TIDE since the past 16 years.

Mr. Aditya
Accounts Executive, Bangalore

Mr. Radhakrishnan R
Accounts Executive, Coonoor

Mr. Nataraj C.
Project Technician

Mrs. Vanaja S.
Office Executive

Mr. Chandranna K.
Office Assistant

TIDE

Resource Persons / Founders

Dr. S. Rajagopalan
Founder Chairman / Mentor

Dr. S. Rajagopalan is a Chemical Engineer with Post Graduation in Management from the Indian Institute of Management, Bangalore. He also holds a Doctorate from IIT Kanpur.

He was the CEO of the Karnataka State Council for Science and Technology, Bangalore, for about 14 years. He was also involved in the management of science and technological research. He has co-ordinated projects in several areas such as rural and renewable energy, rural industry, environment, urban planning and habitat, education, agriculture and life sciences. He was actively involved in policy formulation of the government in S&T. He is one of the pioneers in the use of computer-based Geographic Information Systems (GIS) for the management of natural resources. He was the managing director of Spatial Data Pvt. Ltd. and currently is a professor at IIT, Bangalore.

Dr. Sreekumar

He is a visiting faculty of Chemical Engineering at the National Institute of Technology, Suratkal. His research interest includes energy technologies.

Dr. R. Sethumadhavan

Dr. Sethumadhavan holds a doctorate in Heat Transfer from IIT Bombay and has 27 years of experience in industry, teaching and consultancy. He is an expert in the fields of renewable energy, power plant consultancy, energy conservation and demand side management.

Prof. S.S. Lokras

He is a retired professor of Chemical Engineering from IISc. Bangalore. He holds a doctorate in Chemical Engineering from IISc, He is a 'Distinguished Fellow' of ASTRA, IISc. His major contribution has been in the development, field-testing and dissemination of fuel-efficient wood and other biomass-burning devices and technologies for rural areas.

Prof. K.S. Jagadish

He is a retired professor in civil engineering from IISc Bangalore. He was former Chairman, ASTRA (Centre for Sustainable Technologies) and a pioneer in low-cost and environment-friendly housing. He is currently associated with NGO Gramavidya and RV College of Engineering. He provides valuable technical inputs to TIDE.

Dr. G. Ramamoorthy

He is a subject specialist in Agricultural Engineering. A technical advisor for TIDE, he suggests scientific methodology to factories for quality production of tea. He is a scientist and tea advisor in UPASI-KVK, Coonoor.

Mr. S. Vishwahath

He is a pioneer in the introduction of several innovative rain water harvesting techniques. He is the founder of the Rainwater Club. He is a civil Engineer from Mysore University with a post graduate diploma in urban and regional planning and diploma in urban environmental management.

Annual Report 2009

TIDE

Technology Informatics Design Endeavour

#19, 9th Cross, Malleswaram, Bangalore - 560 003

Phone: 080 - 2331 56 56, 080 - 2346 20 32
e-Mail: tide@vsnl.com

Web: www.tide-india.org