

Providing Potable Water to Millions of India's Rural Poor: Creating Models for Sustainable Development

SHOUDRY REDDY

Bala Vikasa

Warrangal, Andhra Pradesh, India

balavikasa@sify.com

Mrs. Bala Theresa Gingras who hails from Reddypalem, a remote village in Warangal district of Andhra Pradesh, founded Bala Vikasa Social Service Society in 1991. After marrying a French Canadian, Mr. Andre Gingras, and settling in Canada, Mrs. Bala Theresa Gingras wanted to do something for her motherland, as she was very much aware of different problems faced by rural communities in India.

Supported by her husband and family members, Mrs. Bala Theresa started SOPAR (Society for Partnership/sharing) a registered society in Canada during 1977. She initially supported her Indian village Reddypalem with housing, water, education etc. In a very short period of time, the activities of SOPAR spread from Reddypalem to neighboring villages, to district and to the state level. Mrs. Bala Theresa Gingras makes three to four trips a year and lives in India for more than six months to monitor and support the program. As the activities of the organization grew, Mrs. Bala Theresa Gingras felt the need to have a local office for effective monitoring of the projects and as a result, founded Bala Vikasa Social Service Society in 1991 with its head quarters in Warangal, Andhra Pradesh.

Bala Vikasa is a voluntary, secular and non-political organization working with the motto of "Help the people to help themselves." Bala Vikasa is playing the dual roles of fund provider and an implementer. Bala Vikasa established a strong network of more

than 40 NGOs in Andhra Pradesh and implementing different development programs reaching approximately 2000 villages every year.

Bala Vikasa is very much involved in the following activities:

- A Women Integrated Development program in about 1400 villages with 1,750,000 women membership in 20 districts of Andhra Pradesh
- Providing drinking water through 500 overhead tanks, 5000 bore wells, 100-water purification reaching more than 1 million rural poor
- The renovation of 420 traditional irrigation tanks by silt excavation
- Organizing farmers' cooperatives in 5 districts of Andhra Pradesh
- Providing capacity building program to the grass root CBOs, NGOs, GOs and also for the NGOs from national and international communities
- Rehabilitation of Tsunami victims
- Education for the orphans, semi-orphans, poor etc.
- Implementation of youth development programs
- Issuing support to rural public schools by providing water and sanitation facilities
- Research, documentation and consultancy

Bala Vikasa is supported by International NGOs from Canada, Europe, and Hong Kong and also by local donors.

Regional Issues

The following are some of the issues related to water that are faced in the region of Andhra Pradesh:

- Presence of excess Fluoride in Water: Andhra Pradesh estimates more than 4000 habitations are consuming water with excess fluoride. The most affected districts are Nalgonda, Warangal, Ananthapur, Mahabubnagar and Prakasham. The people living in these regions suffer from colored and decayed teeth, crippled bones, joint pains, spinal cord pains, etc. Continuous drought and over exploitation of the ground water resources is one major cause for the increase in the fluoride concentration. As the people of these regions do not have any other options of procuring drinking water, they are forced to drink this highly fluorinated water. People affected by this problem are mostly poor because they cannot afford to get nutritious food and drinking water. People suffering from these crippling diseases are also becoming unproductive.

- Contamination of Water:

Urban Areas: 70% of the contagious diseases are due to the consumption of contaminated water. Industrial pollution plays a major role in the contamination of water. Due to increased industrialization in Hyderabad and surroundings, industrial effluents are freely mixed in the rivers and lakes. The other reason for contamination of water is the sewage problem. Most of the cities like Hyderabad do not have proper drainage facilities. The sewage and the industrial effluents are directly merged in the Musi river which flows through the district of Nalgonda. Musi river, which was once a source of drinking water in the regions of Hyderabad, Nalgonda no longer serves this purpose because it is highly contaminated. People suffer from diseases like diarrhea, cholera, measles, malaria, etc. after consuming this contaminated water.

Rural Areas: The use of chemical pesticides in agriculture, the misuse of water resources, and lack of hygienic conditions are the main causes of water contamination in rural areas.

- Decrease in Ground Water Levels: The causes of decreasing groundwater levels are irregular monsoons, droughts and deforestation. Most of the regions of Andhra Pradesh depend solely on rainfalls, which are very irregular. Farmers are unable to store the rainwater because of various reasons such as lack of storage facilities like lakes and ponds due to the presence of excess silt in the wells and lakes.

With the hope of unearthing water for the crops, the farmers drill bore wells. Every year there is a 50% increase in the number of bore wells drilled. But the pity is that nearly 50% of them fail, which leaves poor farmers debt ridden.

Due to tremendous urbanization there is a rapid imbalance in the eco-system, which also results in the decrease of ground water levels. Due to irregular rainfalls, there is an imbalance between the available quantity of water and the required quantity of water. People in these regions are economically backward and therefore depend solely on government and NGO's to help them. Government has initiated many water development projects but most of them have failed because they could not sustain for long periods and the government failed in encouraging community participation in these projects.

- **Work Load:** As per tradition in the rural communities, it is the responsibility of the women in many families to fetch the water for domestic purposes. Since the water sources are located at far distance, the women and the children walk very far every day to fetch the water. In doing this, the women and children are spending lot of time and energy. On an average the women spend about two to three hours per day fetching water.

Providing Potable Water to Millions of India's Rural Poor: Creating Models for Sustainable Development

Water is life...but unfortunately many rural communities in the state of Andhra Pradesh still do not have access to this basic need. Women and children walking long distances just to fetch a pot of water is still a common sight in most of the villages of Andhra Pradesh. Many of the drinking water sources in the rural areas are contaminated. Consuming contaminated water is affecting the health of the rural communities.

To help the rural communities, Bala Vikasa during the past 27 years has supported more than one million rural population in about 3,500 villages to have easy access to potable water by constructing 500 overhead tanks and 5000 bore wells with manually operated hand pumps in Andhra Pradesh. Bala Vikasa is one of the leading voluntary organizations in providing potable water to rural communities. Bala Vikasa implements these programs all over the state of Andhra Pradesh with its strong network of more than 20 partner NGOs spread over all the districts. The programs are implemented in the most economical, effective and sustainable manner with active participation of the beneficiary communities.

Bala Vikasa's three drinking water supply projects

1. Water Purification Project

Bala Vikasa initiated community owned and managed de-fluoridation projects during the year 2004 as millions of rural people in the state of Andhra Pradesh suffered from dental and skeletal Fluorosis, which is caused by the consumption of water containing excess fluoride. Since Fluorosis is a slow effect and is not a necessary concern for either the victims or the government. Due to this negligence, the victims become crippled and unproductive. Generally levels below 1 PPM of Fluoride in water are desirable for human consumption as per WHO standards. Unfortunately, it is alarming that few villages in Nalgonda district of Andhra Pradesh have the highest concentration of Fluor-

ride (25 PPM). About 4000 villages in 10 districts of Andhra Pradesh are consuming water with more than 1 PPM fluoride and suffer from Fluorosis.

70% of the diseases are caused due to consumption of contaminated water. Statistics indicate constant increase in the fluorosis-affected population in the state of Andhra Pradesh. Due to increased awareness on health issues, many people tend to purchase canned water from the micro-commercial water purification companies. These commercial companies sell 20 litres of purified water between Rs. 10 and Rs. 15 depending on the market situation. Unfortunately, the majority of the rural poor who live on daily wages earn between Rs. 40 and Rs. 60 per day cannot afford to spend Rs. 10-15 everyday on drinking water. Therefore, the poor still go without clean water.

To help fluoride affected communities in rural areas, Bala Vikasa initiated a de-fluoridation project adopting "Reverse Osmosis" technology which not only removes excess fluoride, but also all other unwanted impurities such as Chlorine, Lead, Sodium, hardness etc. Thus the villagers are able to get safe drinking water as per the standards of World Health Organization.

As the de-fluoridation projects are owned and managed by the communities, they are able to produce safe water at an affordable cost of Rs. 1 per 20 litres can. The projects are self-sustainable, as the members are paying the user fee for present and future maintenance of the project. These projects create a visible impact on the health of the affected people within a period of two months after project installation.

Participation is essential for the sustainability of any development program. With a strong belief in this concept, Bala Vikasa will motivate and organize the villagers who come forward by themselves to solve their Fluoride problem.

By March, 2008 Bala Vikasa will have completed 100 projects in 100 villages benefiting more than one lakh (300,000) population in the fluoride affected villages to include Nalgonda, Prakasham, Warangal, Guntur, Mahabubnagar, Rangareddy and Karimnagar.

Criteria for selection of the village:

- Having more than 2 PPM fluoride in the public water supplying source
- A Willingness to implement the project with participation from the whole village without discrimination against caste, religion, or political view
- Beneficiaries willing to contribute 30% of machine cost

- Cooperation between the Gram Panchayats and community to provide raw water supply and existing or new room in the village for installing the machine
- A willingness to unite and work under the committee specially organized for the purpose of project maintenance
- A willingness to contribute a user fee for the supply of water

Water testing: Water samples are collected from the major drinking water sources in each village for testing. Village elders bring the samples to the authorized laboratories for testing. If the results indicate that Fluoride levels are above 2 PPM fluoride they apply to Bala Vikasa.

Organizing and motivation: In every applicant village, Bala Vikasa conducts a series of village informational meetings to explain the process and benefits of the project. This motivates the villagers to unite while solving their community problems. Bala Vikasa has the village elders collect the required data and then assesses the villages' needs, and designs each project jointly.

Local contributions: The villagers contribute 30% of the water purification machine cost. This will be accrued by way of membership fee from the beneficiary families. Each family will pay between Rs. 150 and Rs. 200 as membership fee to meet the 30% of the machine cost. To ensure the equal share among beneficiaries, contributions from single donors, rich class, government share, MLAs, etc. are not accepted. Apart from 30% cash contribution for the machine, the villagers also provide an existing or new room and raw water source for installing the machine. "Gram Panchayat", the village administrative bodies, generally provides these facilities. With these contributions the share of the beneficiaries will be more than 50% of the project cost.

Organizing a committee: the beneficiaries who take care of the project maintenance form a committee consisting of five to seven members.

Role and responsibility of the committees:

- Organize the villagers and conduct meetings
- Collect contributions from the beneficiaries
- Support Bala Vikasa in implementing the project
- Hire necessary staff for operating the machine and maintaining water supply
- Monitor the functioning of the program
- Conduct meetings

Reverse Osmosis Technology: This is one of the best technologies available in the world for water purification. Commercial companies like Coke and Pepsi also use the same technology for their bottled water business. This technology is effective and manageable in rural communities.

Operational system: The project committee hires a person for operating the machine. The machine supplier provides training to the person. This person is actually responsible for operating the machine and producing a sufficient quantity of purified water every day as per the requirements of the members. He is also responsible for machine maintenance.

Water supply system: The purified water is supplied in 20 litre cans to every member. The members come with their cans to the machine, which is generally located in the center of the village at a convenient place. The members purchase the pre-paid cards for 10 cans, 15, cans, 30 cans etc. as per their monthly consumption and economic abilities. Each time they come to the machine and collect the water the operator punches on the prepaid card. This process ensures effective accounting system and economic stability.

Pricing the water: The cost of producing 20 litres of purified water is less than Re.1. In addition to production costs, the committee requires maintenance funds to take care of the repairs. Therefore, the committee fixes the rate at Rs. 2 or 3 per 20 liter tin in the initial year. The machine supplier guarantees the first year's maintenance and therefore eliminates repair costs from the committee in the first year. Therefore, the committee can save all their profits. Once the committee feels that they have enough funds to take care of the project repairs they will reduce the cost of the water from Rs. 3 to Rs. 2, or Rs. 2 to Rs.1.

Village meetings: The Village committee meets every month to discuss monthly activities, revenue, expenses, profits, services etc. Bala Vikasa technical staff will attend these meetings to support committee in organizing effective meetings and monitoring the projects.

General body meetings are conducted for all members involved in the project. During these meetings the annual report is presented and approved along with the financial statements. The annual budget is prepared, committee members are elected, policy is approved, and future plans are made during the annual general body meetings. Bala Vikasa supports the villagers to organize effective meetings.

Maintenance of the project: The companies that supply the machines take care of the first year maintenance. From the second year on, the villagers are responsible. Bala Vikasa is planning to make a federation of the project villages to setup a maintenance unit, which will be cost effective.

Impacts of the water purification projects:

- Improved access to safe drinking water for the poorest of the poor in the rural communities
- Water available at 70 to 80% less price compared with local market
- Improved health among the rural communities
- Increased unity and leadership in the village
- Project committees inspired to take up other development activities in the village

2. Over-head tanks supplying water to the doorsteps of beneficiaries

Bala Vikasa supported 500 overhead tank projects in Andhra Pradesh within the past 25 years. Through this project, the water is pumped from a tube well to the overhead reservoir and then distributed with gravity through pipeline to individual houses in the village.

Criteria for the selection of villages:

- Beneficiaries contribute 15% of the construction cost from their pockets
- Villagers unite without discrimination against caste, religion, political views etc.
- Village administration allocates place for construction of the project
- Villagers elect a committee to organize, mobilize, implement, monitor, and manage the project

Project designing and budget allocations: Bala Vikasa is constructing four different size tanks, which are determined by the village's population size. Standard designs are prepared and budget estimates are made as per the current market prices.

Cost sharing: To ensure genuine need and to create a sense of ownership, community participation is required. Bala Vikasa asks that the beneficiary community contribute 15% of the projects cost while the remaining 85% Bala Vikasa pays in the form of a grant. Donations by Gram Panchayat, politicians, business people, individual donors etc. are not accepted.

Implementation Method: The committees are actively involved in planning, mobilizing, implementing and monitoring the project. Committee members share responsibilities and take part in procurement of material and implementation. The affiliated NGO will provide all necessary technical support for construction and do the monitoring for Bala Vikasa.

3. Bore Wells with manual pump

Bala Vikasa constructed about 5000 bore wells in more than 3000 villages with manually operated hand pumps in the state of Andhra Pradesh. These bore wells are constructed in small communities.

Criteria for approving the support for bore well:

- A minimum of 30 families in need of water facilities.
- Beneficiaries unite without discrimination against caste, religion, political views etc.
- A minimum 150 meters distance from the existing bore well.
- Beneficiaries contribute 15 % of the project cost.
- Committees formed for project maintenance.
- Bore location should be on the roadside in a public land where every one can have the access.

Implementation: Bala Vikasa implements these projects with the support of its network spread in all the districts of Andhra Pradesh. The committees take active role in the actual implementation making the projects more effective and economical.

Impact of overhead tanks and bore wells:

- Increased access to potable water for the rural communities.
- Increase in unity and leadership.
- Improved health among the poor communities.
- Time and energy saved for the women in fetching the water is utilized for productive purposes.
- Improved vegetation in the village with availability of water.
- Increased kitchen gardens increase family nutrition.
- Improved personal hygiene

The water committees do not limit their role to maintenance of the water project alone. With this experience and strong leadership they initiate other development aspects in

the village and contribute to the integrated development of the village. After Bala Vikasa's help, the "Gangadevipally" Village in Warangal district has received best village award at national level.

The Barriers for Access to Clean Water

Contamination of existing resources: Ground water is the major source of drinking water in rural India. The water has been drawn from open wells for centuries. Due to ignorance and negligent practices the water in the wells is becoming contaminated and unsafe for human consumption. Therefore, the scarcity for water is increasing.

Over exploitation of the ground water source: Agriculture continues to be the major activity in Andhra Pradesh, and the success depends on the availability of water sources. Unfortunately the state of Andhra Pradesh depends mostly on either rains or bore wells for crop cultivation. As drought in the area continues for more than a decade now, the ultimate source is to exploit groundwater. Farmers are drilling bore well after bore well with a hope to find a good source. Unfortunately more than 50% of the bore wells are fail in Andhra Pradesh. The number of bore wells dug is doubling year after year. This is causing a negative affect on the quality of water. As the water level decreases, the concentration of the minerals in the ground water increases such as fluoride etc. This is very bad for human consumption.

Lack of public participation in resource maintenance: The government and NGOs have implemented many water projects, but their sustainability is limited due to ineffective maintenance practices. When there is no participation of the beneficiaries, there is no sense of ownership, when there is no ownership feeling there is no maintenance, and when there is no maintenance there is no sustainability. When we notice government sponsored bore wells in villages and school many are not functioning, as they are not maintained regularly.

Lack of budget allocations by the government: The government does not provide a sufficient budget allocation to improve drinking water facilities because allocations are not increasing in proportion to the increase in need. There is no balance between the needs and available resources. If the government can design projects with community participation the expense can be reduced and more projects can be completed.

Bala Vikasa's Future Plans

Bala Vikasa is content with the impact of its three different types of water projects, which are implemented for the benefit of the rural poor communities in the state of Andhra Pradesh. As the projects are ensuring genuine participation of the people at planning, mobilization of resources, implementing, monitoring and maintenance, the scope for program sustainability is very high.

Though Bala Vikasa is successful in its programs it could not reach all the deserving communities due to financial and other limitations. But effective models are created in designing and implementing the water projects especially the water purification and overhead tank systems. Therefore, Bala Vikasa is in a position to help other NGOs and government bodies so that their projects can also be effective.

To share the knowledge and experience of Bala Vikasa, we are planning to make videos in the form of case studies, training material etc so that many will understand the concepts. Bala Vikasa is also planning to organize exposure visits to the field for interested NGOs from around the world.

One of the major expenses for the water purification maintenance is the power bill. Therefore, Bala Vikasa is preparing the water purification project committees to represent their demand for free power supply to the water purification projects which are owned and managed by the village communities.

We are also planning to unite all the water purification villages and make a federation so that they can set up their own sales and service unit. This would provide sustainable, effective, and economical project maintenance.

The water purification project is very effective, economical and provides instant relief to the fluoride-affected communities. Many political representatives are also aware of the projects' impact and have started to allocate small budgets for them. But this is not enough as the need is very big. Therefore, Bala Vikasa is planning to promote the concept through workshops, media cooperation, and publications to influence the government in taking up such projects.

We cannot produce new water even if we have money. Therefore, the society has to conserve water resources and use them in a very prudent manner. The general public tends to waste the water even in the villages where it is scarce. There is no discipline and responsibility among the villagers. Therefore, the general public must be made

aware of all the consequences they will have to face if they continue to neglect water conservation. If necessary, strict disciplinary actions will be imposed in the villages.

Water saving is like water generating. Therefore, the government must provide incentives for the communities putting efforts in saving the water through effective management systems of the projects and economical utilization of the water.

People must feel responsible for the protection of water resources as they often feel it is the responsibility of government to provide them funds. One blaming the other is not justifiable as both are culprits. Both the governments and the general public are responsible for the present situation. Therefore, both should work hand in hand performing their responsibilities in providing and protecting the water resources.

A Success Story on Water Purification

Mulkanooru is a village with a population of around 1400 families. The main source of income for the villagers was agriculture and related jobs. Most of them are seasonal daily wage laborers. Though there were two bore wells, two open wells and 10 hand pumps for the purpose of drinking water, villagers were scared to use them because the water in them contained heavy fluorosis. Villagers frequently complained of colored and decayed teeth, crippled bones, joint pains, spinal cord pains, joint pains, crippled bones, and spinal cord problems. Many young people were unable to work because of severe bone deformalities and nervous problems. The villagers had to spend most of their earnings for the medical expenses incurred due to these problems.

Only 400 families were economically sound enough to purchase the purified water from commercial water plants. They used to spend Rs 10 for a 20 litre water can. The rest were forced to drink the impure water from the bore wells and open wells. They requested the help of the government to solve their problem, but no action was taken.

In the year 2006, a water purifying plant was started in a nearby “Kandugula” village and local media publicized the success of this village. The Mulkanoor villagers have visited this village and learned about its procedures. Optimistic about solving their persisting drinking water problem, the villagers approached Bala Vikasa during October 2006 and explained their problem.

To assess the project need, unity among the villagers, their willingness to participate in the project, Bala Vikasa asked the villagers to mobilize at least 80% of the village

population for an initial motivation meeting. As it is a need of every family about 1300 people participated in the initial meeting and proved their unity, leadership and expressed their willingness to follow the rules and regulations of Bala Vikasa.

During this meeting Bala Vikasa team explained in detail about the water purification plant, the process, technology, its benefits, role and responsibilities of the villagers, leaders, Bala Vikasa etc. The village was divided into 20 groups and each group elected their leader. The committee was responsible for mobilization of contributions in the form of membership fee, which is Rs. 200 as decided at the village meeting. As the need was genuine and there is good leadership and unity the committee was able to mobilize contributions from 800 families within a period of just one week and the remaining have joined in the following weeks.

The village administration provided required room to install the machine and also sufficient water source to supply water to the machine. Within three weeks of the initial meeting the villagers got ready with their room, water source and the 30% contribution. After paying 30% contribution for the project, the villagers have a balance of Rs. 30,000 left over fund, which they turned, into maintenance fund of the project. Looking at the activeness of the villagers, Bala Vikasa installed the machine and the project was inaugurated within one-month time from the initial meeting.

The committee hired 3 staff to operate the project and supply the water to the members. As soon as the project was inaugurated the total villagers started to purchase the water at just Rs. 3 for 20 liters can. Within a period of one year the committee was able to show a net profit of Rs. 2,25,000 after taking out all the maintenance expenses. This is a big success for the villagers.

The committee members used to meet every month on regular date, time and place to monitor the project. Accounts are updated and a print statement is pasted on the notice board at the plant. The committee gained the confidence of the villagers, as they were committed, transparent and effective.

There were some families who did not join the project in the first year due to their economical backwardness. Therefore, villagers during the annual general body meeting decided to allow the members to pay the membership fee in installment.

As the project was able to build Rs. 2.25,000 maintenance fund the members felt it is sufficient to take care of any maintenance of the machinery. Therefore, during the an-

nual general body meeting the members decided to reduce the cost of water from Rs. 3 to 2 per 20 liters tin. This reduction will help the poorest families to buy more water regularly as it will not cost them more than one-day wage per month.