

Sharing Series 7

Drinking Water: Pure and Safe



Bala Vikasa Water Purification Program (WPP): Outcomes of the program, Case study and WPP Manual for NGOs



BALA VIKASA SOCIAL SERVICE SOCIETY

In 1990 Bala Vikasa was established in Warangal, Andhra Pradesh, as an Indian counterpart to SOPAR, a Canadian Non-government Organization. In 1991, it became a registered, secular, non-partisan, non-profit, voluntary, social service organization. Through its collaboration with donor agencies in Canada and Europe, Bala Vikasa assumes a dual role, that of an implementer and a fund provider.

Philosophy

People themselves have to be the true agents of change. Development is primarily for the people and by the people and thus the motto of Bala Vikasa is 'to help people to help themselves'.

Objectives

- Provide support for socio-economic development of the rural poor, especially women.
- Plan, implement, monitor, evaluate development programs.
- Provide institutional support to partner organizations.
- Impart required training for interested community based organizations.

Strategy

- Concentrate on holistic development programs, primarily on the intrinsic social and ethical aspects of human interaction, gradually leading women/community to economic development.
- Help build confidence and a desirable value system by inculcating discipline and human values, like dedication to work, self esteem, respect for the environment, sensitivity to the less privileged, and willingness to participate in community development activities.
- Build partnerships through collaboration with donor agencies and networks to share and work together with the people.
- Focus on replicable, manageable, accountable and sustainable development programs.

Development Programs supported by Bala Vikasa

- Drinking Water through Bore Wells and Over Head Tank systems.
- Surface Water Management through desiltation of traditional water tanks.
- Safe water supply through Water Purification (Defluoridation) System.
- Farmers Cooperatives.
- Healthy Environment and Quality Education to the Children in Rural Public Schools in Andhra Pradesh, India.
- Youth Participation Program.
- Integrated Women Development Program.
- Community sponsorship and scholarship for orphans and poor rural students.
- Training in Community-driven development through its People Development Training Center.

Drinking Water: Pure and Safe



**Bala Vikasa Water Purification Program (WPP):
Outcomes of the program, Case study and WPP
Manual for NGOs**

Sharing series, published by the Bala Vikasa People Development Training Center(PDTC), as the name suggests, is based on Bala Vikasa's eagerness to share the outcomes of research and studies conducted at the grass roots in collaboration with the people for whom development programs were and are intended, with like-minded organizations and donor agencies, who could use the insights gained to plan and implement their own programs.



Sharing Series 1 (SS 1), "Before and After: Impact Study on Bala Vikasa Integrated Women Development Programme (IWDP)", April 2004. ISBN 81-902248-0-8

Sharing Series 2 (SS2), "Water: Bridging the Gap: Impact Study on Bala Vikasa Water Programs", May 2004. ISBN 81-902248-1-6



Sharing Series 3 (SS3), "Microcredit: Not Just Money!: The Story of Bala Vikasa Integrated Women Development Programme Loan Facilities", March 2005. ISBN 81-902248-2-4

Sharing Series 4 (SS4), " Drinking Water: A Catalyst for Community Development", Bala Vikasa Drinking Water Programme:A Holistic Approach to Community Development, March 2006. ISBN 81-902248-3-2



Sharing Series 5 (SS5), "ABCD: The Bala Vikasa Way", An Asset-Based Community Development (ABCD) Approach for Sustainable Development, December 2006. ISBN 81-902248-4-0

Sharing Series 6 (SS6), "The Environment: A Cross-Cutting Theme for Sustainable Development", Bala Vikasa: An Environment Policy for Action, December 2007. ISBN 81-902248-5-9



"Drinking Water: Pure and Safe", Bala Vikasa Water Purification Program (WPP): Outcomes of the program, Case study and WPP Manual for NGOs, June 2008. ISBN 81-902248-6-7

These publications are a product of Bala Vikasa People Development Training Center (PDTC). For information about PDTC and its Sharing Series please contact:

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TABLE OF CONTENTS

ACKNOWLEDGMENT	i
FOREWORD	ii - v
CHAPTER ONE: Water – Pure and Safe	1 - 8
CHAPTER TWO: Outcomes of Bala Vikasa Water Purification Program	9 - 24
CHAPTER THREE: Nachanapalli: a Case Study	25 - 33
CHAPTER FOUR: Water Purification Program Manual for NGOs	34 - 49
GLOSSARY	50 - 51

The background of the page features a faded, light-colored image of several children, likely of South Asian descent, smiling and looking towards the camera. The image is semi-transparent, allowing the text to be clearly visible over it.

Acknowledgement

Bala Vikasa has set up 92 Water Purification Plants in Andhra Pradesh, financed by SOPAR, its sister organization in Canada, KCF, Hong Kong, and School for Children, Italy. This Sharing Series (SS 7) is Bala Vikasa's tribute to these three organizations for having promoted the health of thousands of rural people, by providing pure and safe drinking water.

The smiles on the faces of those who have benefited from the project are symbolic of the results.

Bala Vikasa wishes to acknowledge the success of the project to the people themselves for they have taken the full responsibility to sustain it.

FOREWORD

The goal set by the World Summit on Sustainable Development at Johannesburg in 2002 was to reduce by 50 percent the population that had no access to drinking water by the year 2015. The target seems to elude the reach, and the challenge seems to grow bigger by the day, as water is fast becoming a dwindling natural resource. The present and future requirements seem to hold little hope for humanity, especially to the vast majority living in the developing countries.

By 2050, the number of people who will experience 'water stress' is expected to rise to 4 billion, i.e. around 40 per cent of the world population. The water problem countries are mostly in Africa and Asia. As clean water is distributed unevenly with nearly 500 million of people suffering water stress, 2 billion people obtain less than 50 liters per day to meet basic drinking, cooking and sanitation needs. Declining water supply and quality is the foremost contributing factor in increasing poverty and unemployment. Besides, water scarcities add health hazards and it may be viewed as an ill effect of water degradation on productivity. India, with 20 per



cent of the world's population, has to make do with 4 per cent of the global freshwater resource.¹

Water pollution remains a serious global dilemma with impact on health, of fresh water, ecosystem, and human beings. On a worldwide scale, the pollution of water is probably responsible for more human illness than any other environmental influence. The problem of new pollutants like pesticides has combined to heavily degrade water quality in rural villages. In rural areas, surface waters like rivers and ponds are not the only water sources that suffer from pollution but also ground aquifers, critical sources of both drinking and irrigation, are being affected. Since ground water is basically used for drinking purpose, pollution from untreated sewage and intensive agriculture can cause serious human health problems.²

Water consists of more than 200 elements that affect a person's health, and fluoride is one of them. If consumed excessively it directly affects the health. According to the WHO, consumption of fluoride up to 0.5 ppm is a must; consumption up to 1 ppm is permissible, consumption of fluoride exceeding 2 ppm results in fluorosis. This can also be transferred from mother to the child through the foetus. Fluorosis affects livestock as well.

According to the studies conducted by the World Health Organization, 80 per cent of the diseases are due to the consumption of non-potable water, and people spend a higher portion of their income for treatment of water-borne diseases. This is further adding to their poverty. It is reported that in India 1.5 million people lose their lives, and every year approximately 200 billion man-hours are being lost due to sickness caused by consumption of non-potable water.

¹ Maggie Black: The No Nonsense Guide to Water, 2005, pg. 23-24, Rawat Publications, Jaipur * New Delhi * Bangalore * Mumbai.

² Siddhartha Sarkar: Women Struggle for Sustainability, Pp..178-179, Serials Publications, New Delhi.

The rural drinking supply water program in India is the largest in the world. Since 1970s, the government has been providing water, to 'problem villages' - those whose supply is scant or distant, mostly in hard-rock areas. On account of drop in water table, modern high-speed borehole drilling was adopted to provide safe water. So groundwater has become the eagerly promoted domestic water source. It is now used by 90 per cent of rural population in India.³

Bala Vikasa Water Programs, implemented from the early 1970s through Bore Wells, Over Head Tanks and Desiltation of lakes, have brought relief to thousands of people facing water shortage in the state of Andhra Pradesh in India. The impact of these programs have been published in Sharing Series 2 and 4.

This publication, Sharing Series 7 (SS 7), elucidates Bala Vikasa's inventiveness of installing Water Purification Plants, to expressly solve the

problem of fluoride in the ground water and other contaminating elements. Since 2004, Bala Vikasa (BV) has launched 92 WP plants to provide clean and safe drinking water to the rural people of Andhra Pradesh.

As the name suggests, Sharing Series 7, is to share with voluntary organizations, NGOs, civil societies and donor agencies, the findings of Bala Vikasa's recent assessment of its Water Purification Program, the outcomes of which delineate positive results. Chapter 1, is a retrospection- **looking back** on the Water Program which provided the much needed water from the early 70s, and also Bala Vikasa's **march forward** with a new vision for the new millennium, - the positive action taken to improve the quality of drinking water. Chapter - 2 presents the recent assessment of the Water Purification Program and its outcomes. Chapter - 3 illustrates a real life scenario through a case study based on the village of Nachanapalli- before the installation of the Water Purification plant

³ Ibid., p.43.

and after, with the plant having transformed the village. The people themselves exemplify the qualitative outcomes of this development program.

Finally, in Chapter 4, Bala Vikasa having enhanced its own capacity, desires to share the Manual it developed, which provides details on procedures, processes, guidelines, rules and regulations and roles and responsibilities

of the stakeholders for the sustainability of the project, to those who are convinced that clean water can be made accessible to the rural poor at an affordable price. This can be a useful handbook to those who visited Bala Vikasa Water Purification Plants and showed an interest in replicating the project in their own focus areas/countries, and to others, considering such a program.



CHAPTER 1

WATER – PURE AND SAFE

Man cannot live by bread alone! Whatever name we may call nature's bounty to mankind by, **WATER** will always be equally essential to sustain every living creature. Sadly, this indispensable source is not only fast depleting, but it is also increasingly being contaminated. Access to **Pure and Safe drinking water**, is posing a big challenge. Consequently, it is adversely affecting health and survival of man, flora and fauna, etc. In short, it is affecting our entire ecosystem.



WATER SITUATION IN INDIA

The overall scenario in India is still the unavailability of water, more so, potable water. Despite many development initiatives, with huge amounts having been spent on water harvesting structures and water storage dams, they have not helped meet the water needs in any substantial way. Shortage

of water and inaccessibility to clean and safe drinking water continue to be the bane of the rural people. 'Problem villages' have been on the steady increase. Community organizations for managing water resources have dwindled or become ineffective. Government efforts have not been able to match the growing demand.



To add to the acute shortage of water, the excess of fluoride in groundwater, associated with over-extraction, is also causing alarm in India. Fluoride is tasteless, colorless and odorless, but consumed over a long period of time, it does not kill, but it affects multiple tissues, organs and systems of the body and results in a crippling condition. Fluorosis has affected no less than 62 million Indian people. ⁴

PREVAILING CONDITIONS IN ANDHRA PRADESH

One of the most common and increasing problems in the state of Andhra Pradesh, India, is the high level of fluoride in groundwater. The districts of Nalgonda, Karimnagar, Mahaboobnagar, Warangal, Prakasam, Kurnool, Ananthapuram and Kadapa are particularly affected by excess fluoride in ground water. The world's highest fluoride concentration is observed to be 27 ppm in Pochampally village of Nalgonda district. More than 500,000 people from 1100 villages of Nalgonda, Karimnagar, and Mahboobnagar districts are

suffering from fluorosis, indicating the intensity of fluoride and the vulnerability of the people in these districts.

It is reported that more than 10 million people in Andhra Pradesh are suffering with dental and skeletal fluorosis, caused by consumption of water with excess fluoride concentration. Although it is not fatal, it disables a person, both physically and mentally. Till date there is no known treatment for fluorosis. Only preventive measures can help avoid it.

Victims of Skeletal and Dental fluorosis:

- Become prone to frequent joint pains. This not only increases their medical expenses but also makes them less productive at work.



⁴ Ibid.1, p.44.

- Become permanently affected with physical disability, with continuous consumption of water with high fluoride concentration.



- Tend to age fast and become incapable of doing even light work.
- Suffer from inferiority complex at social gatherings because of their decayed teeth and overall physical appearance.
- Find it difficult to get married.

BALA VIKASA'S PRESENCE IN ANDHRA PRADESH

Thirty years ago, from the early 70s, Bala Vikasa initiated its water program which provided water to

the rural population, as the prime need of the hour then was for people to receive sufficient water at their doorstep for their daily use. Wells were bored and the water squirted from underground. People rejoiced not only in the abundance of water, but in the sweet taste of the water as well. Bala Vikasa's development presence is apparent throughout Andhra Pradesh, as its water program has provided:

Bore Wells:

5800 Bore wells with the collaboration of 15 Partner NGOs, covering 2,03,250 beneficiaries in 4500 villages of 20 districts in Andhra Pradesh with the assistance of SOPAR-CIDA, Canada, SOPAR Schools, Canada, Novara, Italy, School For Children, Italy.



Over-head Tanks:

509 Over-head Tanks with the collaboration of 12 Partner NGOs, benefiting 1,45,250 families in 509 villages of 20 districts of Andhra Pradesh aided by SOPAR-CIDA, Canada, Roncalli Foundation, Canada.



BALA VIKASA'S OBJECTIVE FOR THE NEW MILLENNIUM

More than a quarter century has gone by since Bala Vikasa initiated its first Water Program. Many changes have taken place. Rural people who were earlier less concerned about the undesirable chemicals present in the water, as the taste of 'sweet' water mattered more than its 'purity', are now better informed and aware that 'sweet water' can be deceptive and could be the vector of serious illnesses. With the ample evidence of deformities and degenerative health around them, their concern has received a new dimension, changing from 'receiving sufficient and tasty water' to 'having access to pure and safe water'. They are now even willing to pay for potable water, sold by the micro water purification companies, than pay huge medical bills. Due to this changed mindset, a number of water purification companies have mushroomed all over the state of Andhra Pradesh and elsewhere. A vast majority of daily wage earners in rural Andhra Pradesh, earning less than Rs.50 per day, are now willing to pay Rs.10 and Rs.15 per

20 liter can, an exorbitant amount which they can hardly afford, for the sole reason of safeguarding their health. The poor are inevitably getting poorer.

Recognizing the ill effects of fluoride in the ground water, with the advent of the new millennium, one of Bala Vikasa's objectives has been to improve the quality of drinking water and ensure that rural people have easy access to clean and safe drinking water. In its own way, Bala Vikasa is responding to the United Nations Millennium Goal to advance development and reduce poverty, by providing clean water, improving general health and the overall well being of people, promoting human dignity and equality, ensuring environmental sustainability, and developing meaningful partnerships with communities at the grassroots.

APPROACH

Watershed Development

During the last 7 years, i.e., from 2001 to 2007, Bala Vikasa has implemented watershed development program in 450

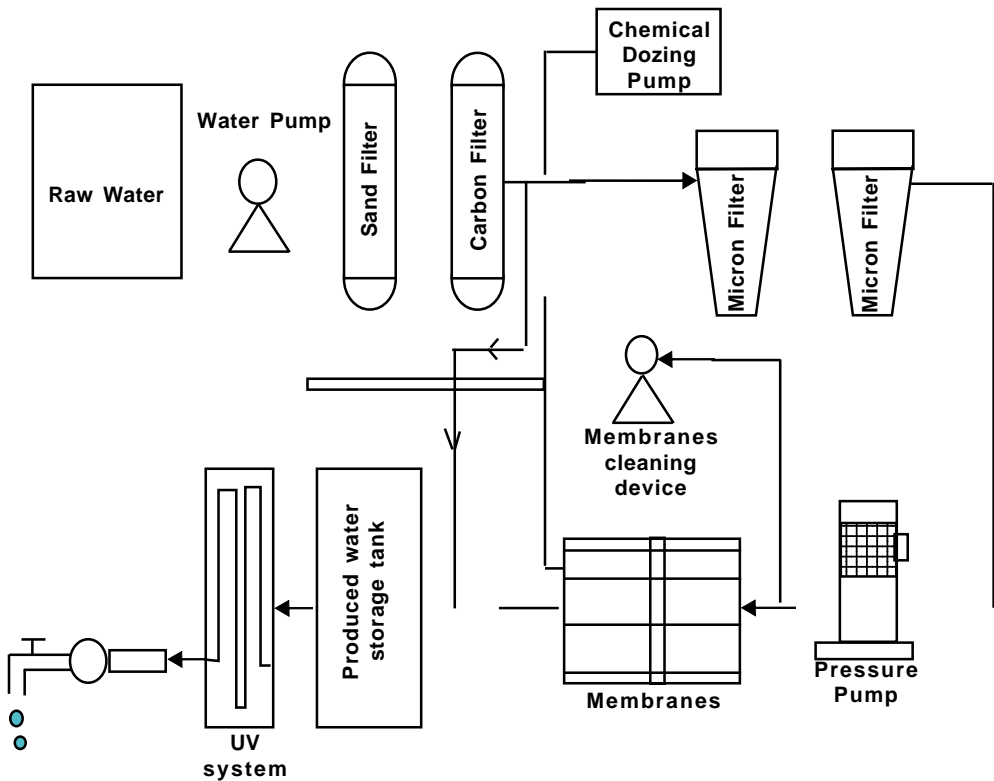


villages in various districts of Andhra Pradesh, covering 2,30,000 beneficiaries through the restoration of traditional and natural lakes, providing clean and sufficient water in the villages and have thereby contributed towards hygienic environment and better health of the rural people.

'Reverse Osmosis' Technology⁵

In the year 2004, BV organized a State-Level workshop to better understand the cause and effects of fluorosis. After a brain storming session with a number of professionals from various fields, who were equally concerned about the increasing number of fluorosis cases in the State of Andhra Pradesh, particularly in rural areas, it was concluded that an effective

solution could only be found in using 'Reverse Osmosis' (RO) technology, as it helps eliminate excess fluorosis, and not only removes excess fluoride from the water, but also removes other redundant elements present, and kills the harmful bacteria. Being a cost-effective technology, implemented throughout the world, Bala Vikasa decided to adapt RO technology to meet the challenge of Fluoride in water.



⁵ Refer to the Glossary.

INSTALLATION OF WATER PURIFICATION PLANTS

A market survey was first carried out to study the availability of machinery required for the setting up of water purification plants. It was found that no company in India actually manufactured the machinery but only assembled the parts secured from different sources/countries. BV finally set up its first Water Purification plant in 2004. Since then, 92 Water Purification Systems have been installed in the fluoride-affected villages in several districts of Andhra Pradesh.



A MISSION COMPLETE

Bala Vikasa has come one full circle. From providing water for the basic needs, it has now culminated in providing pure and safe drinking water to the rural people by



installing Water Purification plants. It has also helped water receive its rightful place as a community resource, and through it, Bala Vikasa has also revolutionized rural communities. Their ownership and sense of pride at being able to manage the WP plants through their own resources, their solidarity-cutting across social groups- and their commitment to the project, have resulted in a sustainable Water Purification Program, as the recent assessment has indicated and delineated in the following chapter.

CONCLUSION

Taking a lead role, Bala Vikasa has set in motion this process of providing Pure and Safe water to the rural people of Andhra Pradesh. A Large number of requests for the installation of WP plants are being received from other villages, a testimony to the success of Bala Vikasa Water Purification Program.



CHAPTER 2

OUTCOMES OF BALA VIKASA WPP⁶

RESULTS BASED APPROACH

Bala Vikasa follows a Results Based approach in all its development interventions. It is BV's policy to assess the outcomes of its programs / projects, at the end of the project cycle, to ascertain if the activities have reached the intended targets and achieved the expected results and also to study the long-term results or impact of its programs and projects after 10-15 years. Assessing results has enabled BV to learn lessons from what has been achieved / not achieved and move



forward / put back on track, the process of planning, implementation, monitoring and evaluation, always ensuring that the specific objectives of a program / project and the expected results, are in keeping with the overall development objectives and philosophy of Bala Vikasa. Assessment and analysis of the Outcomes keep in perspective, the larger vision of Bala Vikasa. Impact studies and lessons learned from it have helped BV replicate its programs/projects more effectively.



⁶ This chapter is based on a Report entitled "Outcome Study of Bala Vikasa Water Purification Program". This report published in May 2008 is available with Bala Vikasa PDTC.

OBJECTIVES

Bala Vikasa's objective of undertaking a Water Purification Program is two-fold:

- to promote the health of people affected by fluoride and other water borne diseases;
- to enhance sustainable development of the poor rural communities.

The objectives of the assessment were:

- to study, both the quantitative and qualitative differences the WPP is making to the lives of the people Bala Vikasa has reached out;
- to learn if the development of the people that has been initiated, will sustain.

METHODOLOGY

Interview Schedules and a questionnaire were specifically designed to elicit information from the WPP beneficiaries (576), the

Water Committee members (69), and the village Medical Practitioners (17). The questions posed related to:

- the villagers' social status, sources of income, economic level;
- health status with reference to improved health - decrease in medical expenses, increase in working days, increase of income, increase in savings;
- sustainable development of the people.



The responses helped Bala Vikasa learn if its prime objective of making clean and safe water available and easily accessible to the intended target group - the poor, in terms of health and economic condition - has been achieved. The indicators of improved health - ability to work longer and better, earn more income, and save more

- were used to collect data directly from the water beneficiaries and validated through a questionnaire completed by the medical practitioners of the areas where WP plants have been set up. Questions pertained to decrease in the number of patients in general, decrease in the number of patients reporting with diseases related to fluoride and other water-borne diseases, and the overall perception of the medical practitioners to the difference in terms of health of the people in their areas of operation, before the installation of WP plants and after.

The study was to learn if the WPP had also acted as a catalyst for sustainable development and if the measures taken by BV had been adequate and effective - making the people themselves active participants right from the conceptual stage, planning, monitoring and evaluation, imbuing in them a sense of ownership, developing leadership qualities, enhancing their capacities, and guiding them to become successful agents of change – to sustain the development of the people. Since true sustainable development

encompasses all the dimensions of sustainability, the analysis focused on the economic, social, cultural, and environmental outcomes.

Since the sustainability of Water Purification plants form the very basis for promoting health and sustainable development, water beneficiary members, as well as members of the Water Committees were queried on matters relating to the maintenance of the water plants, as well as performance of the project staff.

ASSESSMENT OF THE WATER PURIFICATION PROGRAM (WPP)

The study on the Water Purification Program (WPP) covered 27 villages, in seven districts of Andhra Pradesh – Viz., Guntur, Prakasam, Kurnool, Mahabubnagar, Nalgonda, Karimnagar and Warangal.



1. Socio-Economic Status of the beneficiaries

Keeping in view Bala Vikasa's overall development objective i.e. sustainable development of poor communities, it was considered very essential to study the socio-economic status of the WPP beneficiaries, to ensure that the WPP is benefiting the intended group of people.

1.1 Social Categorization

The social categories, as recognized by the Government of India, were taken as the basis.

The study shows that

- 14.11% of the beneficiaries are from Scheduled Castes;
- 3.26% from Scheduled Tribes;
- 65.12% from Backward Classes;
- 17.52% from Others Castes.

1.2 Source of Income

- 54.19 % of the respondents (beneficiaries) earn from leased land, petty business, or depend entirely on daily labor;
- 31.05 % of the respondents cultivate their own land from which they receive their source of income;
- 15.37 % of the respondents work either as Government or Private employees.

1.3 Income per Month

- 6.68% of the respondents earn less than Rs.1000;
- 67.55% of the respondents earn between Rs.1000 and 2500;
- 25% of the respondents earn more than Rs.2500.

From the analysis of the socio-economic status of the beneficiaries, it is amply evident that Bala Vikasa Water Purification Program is reaching its target group, the poor and needy.

2. Health

The following findings, based on the responses given by the WPP beneficiaries and the Medical Practitioners, relate to the beneficiaries' awareness of water-related diseases, health outcomes of WP plants, reduction in the number of patients reporting to the medical practitioners, and reduction in the number of people suffering from water-related diseases.

2.1 Peoples' awareness regarding water-related diseases

- 80.90 % of respondents are aware that joint pains are caused by excess fluoride in drinking water;
- 78.74 % of respondents are not aware that dental fluorosis and bone deformities are related to excess fluoride content in water;
- 57.64 % of respondents are not aware of other water-borne diseases.



2.2 Health Outcomes of WPP

- a. Reduction of Patients suffering with different diseases after the installation of WP plants

- joint pain reduced by 65.30%;
- dental Fluorosis reduced by 34.69 %;
- jaundice reduced by 41.7%;
- diarrhea reduced by 58.69%.

- b. Decrease in the number of Patients

There is 24% decrease in general, in the number of patients reporting to the Medical Practitioners, after the installation of the WP plants in the villages.

c. Reduction in the number of Patients reporting with different diseases after the installation of WP plants

#	Number of patients per month with different sicknesses	Before WPP	After WPP	Increase or Decrease/Reduction in No. of patients
1	No. of patients reporting with joint pain	2830 Ave. p/mp 166	1708 Ave. p/mp 100	1122 Ave. p/mp 66
2	No. of patients with bone deformities	316 Ave. p/mp 19	144 Ave. p/mp 8	172 Ave. p/mp 10
3	No. of patients with dental fluorosis	144 Ave. p/mp 9	119 Ave. p/mp 7	28 Ave. p/mp 2
4	No. of patients with jaundice	155 Ave. p/mp 25	33 Ave. p/mp 2	122 Ave. p/mp 7
5	No. of patients with diarrhea	427 Ave. p/mp 25	105 Ave. p/mp 6	322 Ave. p/mp 19

p/mp = per medical practitioner

d. Decrease in the number of people with different diseases

As per the medical practitioners, there is a reduction in the number of people reporting with different water-related (Fluoride-related and water-borne) diseases by:

1. 1122 - 39.65% : Joint Pains
2. 172 - 54.43% : Bone deformities
3. 28 - 19.44% : Dental fluorosis
4. 122 - 78.71% : Jaundice
5. 322 - 75.41% : Diarrhea



As per 82% of the Medical Practitioners, WPP has made a huge, positive difference in the area of health, and there is an overall 86.7% improvement in the health of the people after the installation of WP plants in the villages.

3. Sustainable Development

3.1 Economic Outcomes

Economic outcomes of the WPP were assessed by taking into account the reasons for/not buying purified water, medical expenses, working days, savings, buying purified water from commercial companies, etc.

a. Affordability of purified water

- The average price of purified water from the BV WP plant is Rs.2/-, while the average price of purified water prior to the installation of the WP plant was Rs. 10/-.

- 56.32% of respondents, who could not afford to buy the purified water, started buying it after the installation of WP plant their villages.
- 94.89% of respondents, who cited that they did not feel the need for purified water as their reason for not buying it, started buying it after the installation of the WP plant, probably because it is now available at an affordable price.
- On the whole, the installation of the WP plants have made a big and positive difference to 92.72 % of respondents who, prior to WP plants' installation, either did not have access, or could not afford, or did not feel the need for purified water.
- 98.31% of those, who were buying the purified water from commercial companies, stopped buying from them after the installation of the WP plants in the villages.

b. Reduction in Medical Expenses

The medical expense on an average per family per year before the installation of the WP plant was Rs.3363.00, while after installation, it came down to Rs.1984.46, with a difference of Rs.1378.54 reduction.

c. Gain in the Number of Working Days

The loss of working days on an average per family per year before the installation of the WP plant was 47.75 days, while after its installation it is 31.20 days, with a gain of 16.55 days.

d. Increase in Savings

- The savings on an average per family per year before the installation of the WP plants was Rs.4876.65,



while after its installation it is Rs.6987.48 with an increase of Rs.2110.83.

- 92% of the respondents indicated 'Reduced price of purified water'; 94%, 'Decreased medical expenses'; and 95%, 'Increased income of family', as factors enhancing their savings.

3.2 Social Outcomes

Two dimensions:

- representation of different social groups on the committees;
- enhancement of unity, were taken into account for assessing the social outcomes of the Water Purification Program.

The first dimension, i.e., representation of different groups on the committees, helps foster unity in the village as every one feels important and included, and has something to contribute. When people of different social groups experience such feelings, there

is integration and solidarity in the village. The second dimension, i.e., unity in the village, is assessed by a number of indicators, like: feeling of togetherness in the community, ability of people to work together, desire to live in peace, and coming together to solve common problems.

a. Representation of different Social Groups on the Committees

- The majority of respondents indicated that they were not denied representation on the committees in the village on the basis of social groups, religion, gender, political affiliation, or status, either before the WP plants were set up as indicated by 98.09% of respondents, or after, as indicated by 99.30% of respondents, with a small but positive difference of 1.21%.

b. Enhancement of Unity

- Indicators, like feeling of togetherness in the community, ability to work

together, desire to live in peace, and people coming together to solve common problems, were used to assess the enhancement of unity.

- A majority of the WPP beneficiaries, 93.40% of community members and 95.28% of Water Committee Members, indicated that unity in the village is enhanced after the installation of WP plants in the villages.

3.3 Cultural Outcomes

In every society, there are certain practices that have cultural biases. Some of these practices could also be gender-biased, causing difficulties for women, implying that certain roles can be performed only by women and not by men. Considering it to be of great value to learn what difference the Water Purification Program has made in the villages, especially in some of the cultural practices, to assess the cultural outcomes, two indicators were used, viz., whether everyone in

the village has equal access to water from the WP plant, and, if men fetch water from the plant.

The cultural outcomes achieved by the Water Purification Program are very revealing:

- 99.8% of respondents indicated that every one in the village has access to water from the water purification plant.
- 99.5% of respondents indicated that men in the family help to fetch water from the water purification plant.

3.4 Environmental Outcomes

Collecting the purified water from the WP plant alone is not sufficient. It is equally important to prevent the contamination of drinking water. It is with this aim a question was posed to the water beneficiaries whether keeping the surrounding clean and hygienic was important to them.

- 94.4% of the respondents expressed that keeping the

surroundings clean and hygienic is important for the prevention of water contamination.

3.5 Outcomes related to Leadership and Good Governance

Leadership outcomes were assessed in terms of the 'performance of Water Committees', and 'performance of water purification plant Operators'.

a. Performance of Water Committee Members

As the role of the water committees is fundamental in mobilizing the communities to achieve sustainability at all levels including the social, cultural and environment dimensions of development, in the "Field study of the Outcomes of Bala Vikasa Water Purification Program", three indicators were used to measure and assess the management performance of Water Committees, viz., commitment, accountability, and transparency.

#	Indicators of performance	Rating Scale				
		Very Good (4)	Good (3)	Average	Poor	Total
1	Commitment	114 19.86 %	339 59.06 %	103 17.94 %	18 3.13 %	574 100 %
		456 26.87 %	1017 59.93 %	206 12.14 %	18 1.06 %	1697 100 %
2	Accountability	96 16.7 %	306 53.1 %	153 26.6 %	19 3.3 %	574 100 %
		384 23.60 %	918 56.42 %	306 18.81 %	19 1.17 %	1627 100 %
3	Transparency	83 10.4 %	376 61.9 %	99 17.2 %	16 2.78 %	574 100 %
		332 19.83 %	1128 67.38 %	198 11.83 %	16 0.96 %	1674 100 %
Performance of Water Committee		98 17.07 %	340 59.23 %	118 20.56 %	18 3.14 %	574 100 %
		392 23.53 %	1020 61.22 %	236 14.17 %	18 1.08 %	1666 100 %

- The performance of 23.53% of the Water Committees is rated as 'Very Good'.
- The performance of 61.22% of the Water Committees is rated as 'Good'.
- The performance of 14.17% of the Water Committees as 'Average'.
- On the whole, 76.30% of respondents indicated the performance of 84.75% of

Water Committees ranging between 'Very Good' and 'Good, implying that the members of WPP are happy and satisfied with their performance.



b. Performance of the WP plant Operators:

Three indicators were used to assess the performance of the WP plant Operators, viz., maintaining water supply timings, plant cleanliness, and personal cleanliness, with a four point rating scale.

- 30.21% of water beneficiary members rated the performance of 37.75% of Operators as 'Very Good';
- 59.72% of water beneficiary members rated the performance of 56.46% of Operators as 'Good';
- 8.51% of respondents rated the performance of 5.36% of Operators as 'Average';
- On the whole, 89.93% of respondents indicated the performance of 94.19% of WP plant Operators to be ranging between 'Very Good' and 'Good', implying that WP plant Operators' performance is very positive and satisfactory.

3.6 Development Initiatives after the Installation of Water Purification plant

Sustainable development can also be gauged from a number of development initiatives taking place in areas in and around a particular program, in this specific case, around the Water Purification Program. Indicators such as: Farmers' Cooperatives, membership in Farmer Cooperatives, Youth Activities, and Women's Groups were with a rating scale of 'Increase after WPP', and 'same as before WPP' were used to assess the development initiatives with reference to WPP.



The study revealed increase in the following Development Initiatives:

#	Indicators of Development Initiatives	Rating Scale			
		Increase after WPP (2)	Same as before WPP(1)	No Response (0)	Variance
1	Farmer Cooperatives	35 70 72.16 %	27 27 27.84 %	7 0	43 +ve 44 %
2	Membership in Farmer Cooperatives	43 86 81.90 %	18 18 17.31	8 0	68 +ve 64.59 %
3	Youth Activities	33 66 68.75 %	30 30 31.25%	6 0	36 +ve 37.5 %
4	Women Groups	54 108 92.31 %	9 9 7.69 %	6 0	99 +ve 84.62 %
5	WPP Committee's influence on other committees	35 70 67.30 %	34 34 32,69 %	0 0	36 +ve 34.61 %
Overall Development Initiatives after the initiation of the WPP		80 76.92 %	24 23.08 %	0 0	56 +ve 53.84 %

- Increase in Farmer cooperatives by 44%.
- 68% Increase in membership in Farmer cooperatives.
- Increase in Youth Activities by 37.5%.
- Increase in Women Groups by 84.62%.
- Increase in the influence of Water Committees on other committees in the villages. by 34.61%.
- Increase in the overall development initiatives.
- Increase in the overall development initiatives by 53.84%.

3.7 Water Purification Plant Sustainability

Bala Vikasa is convinced that Water Purification Program holds great potential to promote health and sustainable development. At the same time, Bala Vikasa is

also very pragmatic that unless the water purification plants installed in the villages are maintained in good condition, neither can health nor sustainable development be promoted. Hence, Bala Vikasa put in place some systems, so that the water purification plants are consistently maintained in good condition, thereby ensuring sustained health and development.

The systems that are put in place are in the nature of:

- water committee meetings;
- responsibility for informing the machine supplier about the technical problems related to the WP plant;
- visits to the WP plant by Water Committee members;
- performance of the project staff;
- participation of people.

a. Committee Meetings

'Regularity in which the meetings are conducted', and 'Regularity of attendance by Water Committee members' were the angles from which the Water Committee Meetings were assessed.

The study revealed that:

- 45.76% of the Water Committees conducted all the meetings;
- 23.73% of the Water Committees conducted most of the meetings;
- 30.51% of the Water Committees conducted some meetings.

Attendance of the Committee Members at Monthly Meetings

The study revealed that:

- 68% of the Water Committee Members attended all the meetings;
- 22% of them attended most of the meetings;
- 10% of them attended some meetings.

b. Responsibility for informing the machine supplier about the technical problems pertaining to the WP plants

- 43.5% of the water committee members indicated that both the Secretary of the Committee and the Operator take responsibility to inform the machine supplier;
- 56.5% of the Committee Members indicated that only the Operator takes responsibility to inform the machine supplier.

c. Visits to the WP plant by Water Committee Members

- 42% of the Committee Members indicated that they visit the WP plant daily;
- 58% indicated that they visit the WP plant frequently.

d. Performance of the Project Staff

It was felt that performance of the project staff has an impact on the maintenance of the WP plant. To maintain the plant in

good condition, certain chemicals are required, and they need to be purchased in time, and the right quality and quantity are imperative. These involve financial transactions on a regular basis. Hence, the three indicators, used to assess the performance of project staff are: preparing and submitting the accounts regularly to the Water Committee members; maintaining the accounts correctly; and maintaining the water plant in good condition.

The study revealed that:

- 100% of the project staff regularly prepared and submitted accounts to the Water Committee every month;
- 97.78% maintained the accounts correctly;
- 92.19% maintained the Water Plant in good condition.

e. Participation of WPP beneficiary members

The participation of people is assessed in terms of their attendance at the Annual General Body Meetings, Regularity in bringing cards and

cans when they come to collect water from WP plant, and keeping to fixed time with a rating scale of 'Very good', 'Good', 'Average', and 'Poor'.

The study revealed that:



- 63% of the Water Committee Members rated the participation of 72.25% WPP beneficiaries - with reference to the parameters of – 'attendance at Annual General Body Meetings', 'bringing cards and can regularly when they come to collect water' and 'keeping to fixed time for collecting water' - as 'Very Good';
- 36.25% of Water Committee Members rated the participation of 27.75 % of water beneficiaries with reference to the above same parameters as 'Good'.

4. Conclusion

Bala Vikasa's "Field study of the Outcomes of Water Purification Program" validates it is providing clean drinking water to people who have meager sources of income, most of them living below poverty line and belonging to low social groups. It is therefore concluded that the program should continue, and even more importantly, expand to other villages.

The study specifies that only few people are aware of the health risks of unclean water. Consequently, people need to be further educated and sensitized to water-borne diseases. It is recommended that Bala Vikasa should enhance its clean water awareness campaigns with the rural communities.

The study also indicates that the Water Committee Members have built their capacities and are efficient and effective. Therefore it is suggested that the training of the Water Committee Members should be continued and intensified so as to make them dynamic agents of change in their communities.

CHAPTER 3

A CASE STUDY DEVELOPMENT PERSPECTIVE OF THE RIPPLE EFFECTS OF BV WATER PURIFICATION PROGRAM: NACHANAPALLI VILLAGE

Nachanapalli, an amalgamation of three different hamlets, is in Warangal District, Andhra Pradesh. It has a population of 7000. The heart beat of the village is the Telugu medium Zilla Parishad High whose students have done the school and the village proud.



Like many other villages in Andhra Pradesh, Nachinapalli also suffered from acute water shortage. People depended on the open wells and bore wells to meet their drinking water needs. Women had to walk miles to fetch drinking water until 1997, when Bala Vikasa Water

Program solved the problem by providing the village with a Overhead Tank with a capacity of 1,60,000 liters. Nachanaplli has been a progressive village ever since. It has a Cooperative Society in which both men and women have membership, 47 Self Help Groups, with 38 of them organized by Bala Vikasa, and both men and women have savings.

What Nachanapalli did not have was accessibility to safe drinking water. With increased awareness on the ill effects of contaminated water on health, to solve the problem, the villagers started buying water at the rate of Rs.10/- per 20 liter can, from nearby Gangadevipalli Water Purification Plant.

Having learnt the positive effects of clean and pure water on the health of the people of Gangadevipalli,



the villagers of Nachanapalli requested Bala Vikasa to install a 'Water Purification Plant' in their village. After verification of the need, and following the set procedures, Bala Vikasa installed a Water Purification Plant in Nachanapalli in 2005.

770 families, i.e., 85% are members of the Water Purification Project, with each family paying a membership fee of Rs.300. The 15% families who have not taken membership are those who are not permanent residents of the village.

Purified water is being sold to the members at Rs.1/- per 20 liter can. On an average, 150 to 200 liters of purified water is distributed daily to the members. The amount collected every month helps in the monthly maintenance of the equipment, for the purchase of chemical required to purify water

and for the remuneration of the operator.

A Water Committee of 11 members, with the designation of 'President', 'Vice-President', 'Secretary', 'Treasurer' and 'Directors' manage the WP plant. The Treasurer maintains the accounts of the WP plant on a voluntary basis. The committee meets once a month, and monitors the accounts and other matters related to the WPP.

Annual General Body Meetings are held every year. Two such meetings have been held so far, attended by all the WPP members. Some major decisions were taken, including increase in the remuneration of WP plant Operators.



With one-third of the Water Committee members completing their term of office, the General Body Members elected the new members.

The accounts are maintained regularly and displayed every month on the notice board of the WP plant. After 3 years, there was a closing balance of Rs.1,05,000. After meeting all the expenses of repairs and general maintenance, Rs.50,000 was put in a Fixed Deposit.

Villagers of Nachanapalli are ever eager to improve their village. The Water Committee members are presently engaged in getting



electricity for the WP plant at a cheaper rate. They are also working towards forming a Farmers' Cooperative in the village. The Water Committee members are taking the initiative to bring together the representatives of the other Committees in the village, to work in a more coordinated manner for the overall development and larger good of the village.

Since the villagers of Nachanapalli have taken effective ownership of maintaining the Over Head Tank and sustaining it over the last 10 years, and managing the WP plant successfully, in recognition of the people's spirit of cooperation, dedication, transparency and commitment to their village development, Bala Vikasa has given an incentive of Rs. 25,000. In addition, Bala Vikasa is now helping construct a second Overhead Tank, to meet the needs of the growing population.

In view of the fact that Nachanapalli has emerged as a model village, Bala Vikasa has also sanctioned a new program called Village Vikasa Pathakam (VVP) that aims at enhancing health, the environment and greenery. Rs.10,000 worth of plants have been planted in the school premises and in the homes of the pupils. The students have



taken upon themselves the responsibility of protecting the saplings planted in the village.

THE OUTCOMES OF THE WATER PURIFICATION PLANT

1. It has increased cooperative and collaborative interactions among the people:

- The school having always been the focal point of the village and situated in the center of the village, on the proposal of the Water Committee, the school authorities provided a room for installing the Water Purification plant. In lieu of the schoolroom, another room adjacent to the school was given for the use of the school;
- Since more drinking water is required during special occasions and functions, like marriages or other social or religious festivals, there is a common understanding among the villagers that purified water would be sold on such occasions for Rs. 3/- per

can (Rs. 1/- for water, and Rs. 2/- by way of rent for the can), on condition that all the cans are returned to the site of the water purification plant;

- Villagers contributed Rs.516 on the occasion of the 'Solidarity Event' this year, recognizing the need to be sensitive to those less privileged than them, and support the village orphans.

2. The Water Purification plant has provided employment for two operators.

3. It has improved the health.



THE RIPPLE EFFECT FROM NACHANAPALLI

Since the installation of the WP plant in Nachanapalli 3 years ago, people from the surrounding villages, having heard about the pure water produced by the WP plant and better health enjoyed by the people of Nachanapalli, took the initiative to contact Bala Vikasa. Within a short span of time, more WPPs were sanctioned and set up.

- The people of seven villages from the Narsampet division—Thogarrai, Lakenpalli, Chelaparathi, Thimmampet, Konapuram, Girnibavi, and Madannapet—approached Bala Vikasa for Water Purification projects. On fulfilling all the conditions, the Water Purification plants were set up in all these villages. The number of people enjoying improved health, and reaping the benefits of development, has grown many fold.
- More requests are continuing to be received by Bala Vikasa. The ripple effect of the success of Nachanapalli, the

visible evidence of people enjoying better health after the initiation of the Water Purification Program, is motivating even remote villages to go the Nachanapalli way.

- A Member of the Legislative Assembly, (MLA) has made provision for setting up 2 Water Purification Plants, one each in Narsampet and Ponakal, with the development fund allotted to his Constituency. The success of WPPs is improving collaboration and goodwill between the people and their political representative.
- With more and more WP plants installed/to be installed, the major positive development impact will be on the general health of the rural people.
- With more and more villagers being involved in the planning, implementation and monitoring of projects, as per the norms of Bala Viksa, the ground is being set for increasing the sustainability of the development programs.

PEOPLE THEMSELVES EXEMPLIFY THE OUTCOMES

P.Tirupathiaiah, the Secretary of the Water Committee of Nachanapalli says of the efficiency of the WPP systems established by Bala Vikasa, and the influence of Water Committee of Nachanapalli: *“The Village Development Committee of Ponakal, an adjacent village, had approached us, requesting us to teach them about the various procedures and systems involved in setting up and maintaining the Water Purification Plant. We taught them everything: Preparatory meetings, Membership Fee, formation of Water Committee, the role of Water Committee, Committee Meetings, the General Body Meeting, the Card system, the role of Operator, Accounting system, Maintaining the timings for water distribution, how to attend*



to technical problems of the Water Plant, etc. While setting up the WP plant, as well as afterwards, the Village Development Committee of Ponakal adopted the systems that we passed on to them from what we learned from Bala Vikasa. The inputs we gave on procedures, technical matters, and helping the Committee of Ponakal conduct their meetings have been possible because of the leadership training we received from Bala Vikasa, and for the success of the water purification plant at Ponakal. ”



Gudipalli Dharma Reddy, President of the Water Committee said: *"The farmers in the village, during the harvesting of crops - whether they be cotton, chilli, turmeric, or groundnut - take 5 or 6 cans of purified water, paying additional amount of money that is fixed for extra cans, in order to provide clean drinking water to the workers. Farmers have realized that by providing purified water, it not only quenches their thirst, but also protects their health, thereby enabling them to work better and for more number of days. Farmers are now ready to buy purified water for their workers during the harvesting season."*

Dharma Reddy expressed his experience with his village people. He said: *"It is very*



important that we attend promptly to any technical problems that arise in the working of the WP plant. In fact we are under pressure from the people. On one occasion, a Water Committee member had to rush to Hanamkonda to personally bring the technician to the plant to attend to the repair. Now we get in touch with the technician over the phone and he responds at once and attends to the repair. People become very agitated if



there is a delay in receiving drinking water due to technical problems. Foreseeing their reactions, we get the WP plant repaired as soon as we can. During the summer season, there is demand for additional cans of purified water. This situation is aggravated by power cuts. To solve this problem we have bought a number of additional cans. The Operator of the night shift works almost till the early hours of morning, filling the cans, to make purified water available to the people. Maintaining the Water Purification plant is not merely a technical job. It needs commitment on the part of the Water Committee and the Operator, a commitment to ensure the health and sustainable development of people."

Nalla Ranga Reddy is convinced about the good that the WPP has done. He declared: "After



the Water Purification Plant has been set up in the village, two good things have happened: One, the age-old custom of women carrying the drinking water from the nearby wells has come to an end. The roles are now reversed. It is now the turn of men to carry water from the WP plant. The day the men do not collect water, for any reason whatsoever, there is confusion in the family. Women are not able to cook and all have to go without food. Anticipating such problems, men have no option but



to fetch water for their homes. This role change is a good thing that has happened as a result of setting up of the water plant. Otherwise the practice of women having to carry water, solely bearing the burden, would continue. Men's attitudes have changed. They have become very cooperative".

"Earlier we used to buy the purified water at the rate Rs.16/- per 20 liter can. It was a financial burden. Now, I can say from my personal experience, that I feel healthier than before and people in general have become more health-conscious. Their awareness on health matters has increased. It is all due to the purified water made available and accessible at a nominal rate by Bala Vikasa".

THE QUALITATIVE RESULTS OF THE WPP

General Body Meetings, in which women are given an opportunity to actively participate has encouraged women to air their problems. In one instance, a woman spoke about

her concern on the sale of liquor in the village and how it was ruining families. Although her husband abused her for speaking her mind in public, other village women supported her. In solidarity, the women took action to curtail the sale of liquor and the habit of drinking among their men. With persistent efforts, the women formulated strict regulations and eventually managed to get them approved by the entire village. WPP and the mechanisms put in place by Bala Vikasa for peoples' participation, has empowered the women of Nachanapalli. Savings in the families have increased which is being put to better use. The ripple effect is that women of other nearby villagers are following suit. WPP is bringing qualitative changes to the lives of the rural people and an overall development

The Water Committee members of Nachanapalli, in the sensitivity shown to the physically challenged people of their village, have become role models of their community. They have helped the physically challenged to organize and register themselves as a 'Society', to help them receive

government benefits such as monthly allowance, and other concessions, including a special quota reserved in certain jobs for the physically challenged. The committee members' consideration and humaneness for the disabled is a reflection of their new altruistic mind set, a result of their own self-development.

THE WPP COMMITTEE MEMBERS LOOK BEYOND THE PRESENT

Water Committee members in Nachanapalli, in reflecting the present situation in the village with the staff of Bala Vikasa, have realized certain lacuna in their system.

1. Women have not been given representation in any of the village committees.

2. The elderly residents of the village, whose children are either working in other cities in India or abroad, do not receive assistance from the villagers to meet their needs.

Committee Members are now committed to look into the representation of women in various village committees and the care and protection of the elderly. They are now fully aware that sustainable development of people includes the well being of all groups at the village level. It encompasses everyone, irrespective of gender or age.

In looking beyond the present, the Water Committee members are planning to bridge the gaps for a better tomorrow, a vibrant development outcome of the Water Purification Program.



CHAPTER 4

WATER PURIFICATION PROGRAM MANUAL FOR NGOS

PROLOGUE

The purpose of including this Manual in Sharing Series 7, is to make available to NGOs interested in undertaking a Water Purification Program, practical guidelines i.e. course of action to be taken, procedures, techniques, conditions, work guidelines, roles and responsibilities of staff and beneficiaries, etc., from the conceptual stage through planning, implementation, monitoring, and evaluation.

This Manual was developed by Bala Vikasa staff for its own use and hence pertains to its Organization, Program/Project staff. It was found to be an effective and useful tool. The tested procedures and guidelines are presented here as suggestions to help other NGOs desirous of initiating a similar program.

INTRODUCTION

Bala Vikasa put in place a set of norms, procedures, practical guidelines/criteria, conditions, work guidelines, specific roles and responsibilities of persons involved in the project, etc., with the following objectives.

OBJECTIVES

1. To make the drinking water project effective at every phase-viz., planning, implementation, monitoring, and evaluation.
2. To secure the full participation of the people for whom the program is intended, in order to make them ultimately responsible for the management of the water plant.

I. PROCEDURES FOLLOWED AT THE CONCEPTUAL STAGE

Primary conditions

1. Villagers have to be willing to provide a common place for the installation of the water purification equipment, as well as raw water source equipped with motor pump.
2. Villagers have to agree to contribute 30 % of the cost of the machinery and an additional 10 % as their share towards maintenance fund, with the Donor agency providing 70 percent as a grant.
3. The 10 % of maintenance fund, deposited with the organization for one year, to be refunded after assessing the performance of the committee during that period.
4. A representative group, comprising of a small number of people, from the village, is to form a 'Water Committee' to assume responsibility for ensuring equitable distribution of purified water and proper and regular maintenance of the plant.

II. GUIDELINES

1. Prior to setting up of the Water Purification Plant

a. Application

Villagers keen to have a WP plant in their village should first submit an application, requesting installation of a WP plant, together with a water analysis report from an authorized source. The request should be considered if the village has a fluoride level of more than 2 ppm, and subsequently, the capacity of the machine, depending on the size of the village and the number of households.

b. People's participation

There should be people's participation from the outset. They have to fix a suitable date and time for the meeting at the village and inform the implementing organization. The Program Officer should attend the meeting, and motivate the



people and emphasize the need for their participation in planning, implementing, and monitoring the program. If 85 % of people from the village attend the meeting, it would be an indication of the peoples' keenness to have a WPP in their village. Based on this rationale, the project could be sanctioned. If the attendance criterion of 85% is not fulfilled, it can be assumed that only a few people feel the need, and they do not have the approval of the majority of the villagers. In such a scenario the request need not be considered.

c. Formation of a Water Committee

A temporary committee should be formed during the motivation

meeting. The members should be elected without any reference to caste, creed, status, political or religious affiliations. This committee should take the responsibility of mobilizing local contribution. The committee should also decide the amount to be paid as membership fee.



d. Local Contribution

The committee should mobilize 40 % from the beneficiaries towards their share of the machine cost and its maintenance, and collect funds required for the construction of building, bore well and a motor pump (where it is not available), as part of the local contribution. Each beneficiary household should pay a Membership Fee. Funds should be mobilized

through the membership fee per family. The mandatory requirement of local contribution is mainly to foster in the beneficiaries a feeling of ownership of the project so that it promotes in them a sense of responsibility for the sustainability of Water Purification plant right from the planning stage onwards.

The committee should ensure that at least 95% of families enroll themselves as members of this project. Parents and married children living separately are to be counted as separate households. Families, expressing their inability to pay membership fee in one installment, may be given the option of paying in separate installments to facilitate their enrollment. All funds should be categorized only as membership fee. No single donation or group donation in bulk should be accepted.

e. Training

The elected committee members should receive training. This training must impart practical knowledge pertaining to requirements for the installation of the equipment, the roles they have to play as per their designation, and the responsibilities they have to assume as Committee Members. The committee should identify a person who can work as a machine operator. If required, another person to function as an accountant may also be identified. Once identified, inputs should be given to the operator on plant operation and maintenance, and to the accountant on account keeping, as well as on accountability.



2. Infrastructure for the Equipment

a. Location and Building

The committee members should prepare in advance, a room with 12'X16'X12' dimensions, for the installation of the **equipment**. If a room with the prescribed dimensions is available, but not in good condition, it will be the committee members' responsibility to have it repaired in order to meet the requirements for the installation. If there is no room available, the committee has to locate a public place and have the room constructed with the funds mobilized. The title of this land should be in the name of the water purification plant. If no public place is available, the committee would have to purchase land and have the title registered in the name of the



water purification plant. The committee can receive any land donated by a person, but it should be clearly indicated that it is donated and the ownership title should be with the water purification plant.

b. Colors

If installation of more than one WP plant is planned, it would be good to keep a uniform color scheme for easy identification and aestheticism.

3. Purchase of Machinery

a. Calling for Quotations

It is best to call for quotations from various companies involved in assembling the parts of water purification machinery, and to select the bidder complying with requirements of quality, durability and cost-effectiveness. A contract must be entered into, for availing the needed services free of cost during the first year. The prices for different capacities of the machines must be fixed and should not be liable for any alterations in the middle of the financial year.

b. Components of the equipment

- Sand Filter -1
- Carbon Filter - 1
- 1 Dozing pump – 1
- Micron Filters – 2
- Pressure pump – 1
- Membranes – 4
- Membrane protecting devices – 2
- Stand, control panel – 1
- UV system – 1
- Valves – 2
- Produced water storage tank – 2
- Filter cleaning device – 1 set
- Plastic chemical drum – 1
- Chemical
- Voltmeter – 1
- TDS meter – 1
- Flow meters – 2
- Pressure gauges – 2
- Water meters at both inlet and outlet level



4. Installation of the Equipment

a. Transportation

It should be made mandatory for the assembler to transport the equipment to the project site, at his own cost, at least two days before the inauguration of the WP plant. As a precautionary measure, it should be agreed with the supplier, that in case of delay in delivery, a sum of Rs. 5,000/- would be deducted from the equipment cost. A checklist, listing all the machine components, should be given to the committee members to ensure that all the listed components are received on delivery.

b. Installation

The supplier should be responsible for the installation of the equipment at the selected site, well in advance of the inauguration, and for testing its proper functioning in the presence of the committee members, and also making certain that there are no defects in the equipment. The

committee members should then sign the format attached to the checklist, and send it to Organization for payment along with the checklist duly signed.

c. Training the Operators

The supplier will have to take the responsibility for organizing and conducting on- site training to the selected machine operators. The operators should be familiarized with the mechanism, operation, and cleaning of the equipment, filters, backwash, etc.



5. Implementation of the Project

- a. Maintaining uniformity in the size of containers for the collection of water from the water plant should be made mandatory. It should be specified that only plastic

containers having a capacity of 20 liters would be permitted, and collection of water from the plant in containers of different sizes will not be accepted.

- b. Beneficiaries should be advised, prior to the implementation of project in the village, to purchase plastic cans made of soft plastic, as it does not cause any harm to health, unlike the hard plastic that causes considerable harm.



- c. Since water supply like any other service also involves operational cost, villagers should be informed in advance, the production cost for 20 liters of water. (A guideline- in Andhra Pradesh it costs Re. 0.75)
- d. The purified water will have to be sold at a price higher

than the cost of production. The marginal gain should be with the water committee to meet unexpected expenses like machine breakages, etc, that may occur at any point of time. The water committee should fix the price, but under no circumstance should it be expensive. (In an Indian situation, it should not exceed Rs.3/- per can), so that the majority of beneficiaries will be able to afford and benefit from the purified water.

- e. Every beneficiary household would be expected to purchase the can of prescribed size and a pre-paid card for 15 cans per month. The beneficiaries would be required to produce the pre-paid card whenever they come to collect water from the plant.



f. The Operator should:

- enter in the cards the details of the beneficiary, and the price of the cans;
- supply the water as indicated in the pre-paid card;
- maintain strict timings for distribution of water;
- purchase cans;
- meet the maintenance and the operation costs of the plant, etc.

6. Beneficiaries' Responsibilities

- a. Should pay his or her share of the membership fee.
- b. Should buy a plastic container of the stipulated size, i.e. 20 liters, as no other water storing device will be accepted.
- c. Every beneficiary household should purchase a pre-paid card.
- d. Should adhere to the prescribed timings for the collection of water

- e. Should ensure their cards are punched as and when they collect water during the scheduled timings.



III. WHO IS TO DO WHAT?

1. Water Committee Members

Monitoring water production, maintaining bank account, etc.

2. Operators

Punching the card, maintaining the prescribed timings for the supply of water, ensuring the proper operation of meters, etc.

3. Accountant

Collecting money from the members, recording the amount of water sold, bookkeeping, preparing and presenting financial statements etc.

4. Salesman

Servicing the machinery, attending to complaints, entering into an Annual Maintenance Contract (AMC), etc.

5. Program Officer

Monitoring, conducting meetings, training, and evaluation.

IV. ROLES AND RESPONSIBILITIES

1. Head of the Organization

- Identifying various machine vendors;
- Negotiating for the best price in purchasing machinery;
- Preparing and getting agreement signed with the equipment vendor;
- Approving the project to the village;
- Monitoring the program implementation.

2. Program Officer

- Creating awareness among the villagers on the ill effects of consuming contaminated water;
- Organizing street plays in the villages to create awareness;
- Collecting the applications from the villages;
- Undertaking the feasibility study of the village;
- Encouraging the people to make their contributions to the project, and closely monitoring the fund mobilization process in the village;
- Collecting the applications from the villages



- Sending the proposal to the Associate Director for approval of the project;
- Organizing training programs on leadership development to the committee members;
- Organizing technical training/account keeping to the machine operators and accountants;
- Visiting the village every month to monitor the project implementation.

3. Machinery Salesman

- Delivering the machine in the village one day before the project inauguration;
- Providing technical assistance to the machine operator;
- Responding to the complaints made by the villagers and attending immediately to repair the faulty machine;

- Replacing the malfunctioning part of the machinery free of cost during warranty period;
- Entering into Annual Maintenance Contract (AMC) with the village Water Committee on the completion of warranty period;
- Replacing the malfunctioning part of the machinery, free of cost during warranty period.

4. Water Committee

- Organizing the villagers and mobilize the local contributions;
- Identifying a location for the installation of the plant;
- Making arrangements for the raw water supply, and providing a room for the machine installation;
- Receiving the equipment on its delivery to the plant site, with prior sanction of the organization;

- Appointing the project staff responsible for operation, maintenance of machine and accounts;
- Collecting the monthly user charges from the members.;
- Conducting monthly meeting and presenting the report to the members of the project;
- Conducting the Annual General Body meeting;
- Monitoring the maintenance of the project on day-to-day basis.

5. Machine Operator

- Operating the machine as per the instructions given by the machine salesman;
- Distributing the water to the members;
- Periodically checking the TDS⁷ of the water with the meter provided by the salesman;
- In case of repairs, reporting it to the machine

salesman and ensuring prompt action of technicians to solve the problem.

6. Accountant

- Maintaining the day-to-day accounts;
- Preparing the accounts at the end of every month and submitting them to the committee;
- Updating all the records provided.

7. Member

- Paying the membership fee;
- Purchasing the monthly cards;
- Coming to the plant with a 20 –liter can during the prescribed time;
- Attending the monthly meetings organized at the village level;
- Attending the Annual General Body meeting held once a year.

⁷ Refer to the Glossary.

V. GUIDELINES TO ENSURE SUSTAINABILITY OF THE PROJECT

1. Modalities of Machine Operation and Accounting

- After the installation of the machinery, village committee should appoint a person as an operator who is trained in maintaining the plant. He should work on a full time basis and ensure, on a daily basis, the quality of water produced with the help of the TDS meter. He should also be responsible for the smooth operation of the plant and for maintaining accounts.

- If an accountant is also hired, he should take care of the accounts related to the water plant, to ensure effective accounting system and economic stability.

2. Modalities of Water Supply and Distribution

- The operator should fix the time for the supply of water and ensure harmony among

the beneficiaries while collecting water from the plant.

- Members should purchase their own cans and also a prepaid card of 10, 20, or 30 cans per month. The purified water should be distributed only to members with the stipulated 20 liter can and card. At each collection, his/her pre-paid card should be punched by the operator. Water may be sold to the members with no prepaid card, only if the plant has excess water.

3. Pricing the water

- The beneficiaries should decide the price of the water supplied. (It would cost approximately Re. 1/- for producing 20 liters of water in Andhra Pradesh, India). The excess amount can be put into the maintenance fund. The excess cost levied to meet the recurring and the administrative expenses, can be reduced once they have sufficient funds.

- Expenses, if any, should be met by the fund, and at the end of every month the receipts and payments statement should be presented to the members at the meeting. A bank account must be opened in the name of the village water committee and money collected should be deposited every month into the bank account.

4. Maintenance of the Plant Machinery

- The Company that supplies the machinery generally takes care of the maintenance for the first year. In the subsequent years, the village Water Committee should enter, on behalf of the members, into an Annual Maintenance Contract (AMC) with the service providers. These expenses should be met from the amount deposited in the bank.
- When the number of de-fluoridation plants increase, a federation can be formed

and it can set up a maintenance unit, which would become cost-effective.

5. Provision of Technical Support

- In the initial years, Organization staff members should visit the project regularly every month and participate and help the committee members in conducting the meetings and monitoring the project.
- Staff members should ensure that harmony is maintained in the project villages, and that the plant is maintained in good condition by undertaking repairs on time and meeting the expenses and the operational cost from the fund deposited for the purpose.

6. Ongoing Trainings

- **To the Operators:** Regular training programs should be conducted for the machine operators, and training should

be given in machine maintenance. The committee members, and the technicians appointed by the machine vendor, should also attend the trainings. The technical problems faced by the operators must be brought to the notice of the technicians; who in turn should take necessary steps and resolve the problems immediately. Where an instant solution is not possible, the technicians should give a date to the operators and visit the project to resolve these problems.

- **To the Accountants:** Regular trainings should be given to the accountants. The accountants should attend the training along with the accounts prepared by them. Staff should offer suggestions whenever the accountants face a problem. During the training, an opportunity should be provided to all the accountants to share their knowledge, and to verify the accounts mutually.

- **To the Committee Members:** Training should be provided to the committee members three times a year to enhance their leadership abilities to become agents of change in their communities.

7. Meeting

The Committee Members of the each village should meet once a month to discuss the operational, technical and financial status of the project. The meeting place, date and time must be fixed and must not be subject to alterations unless an unforeseeable event / genuine reason warrants it. All the members should be informed about the venue and time of the meeting and advised to attend it without any reminders. The members who fail to attend the meetings for two consecutive months must be made to forfeit their membership in the committee without any formal notice / information. The Minutes of meetings, along with the resolutions and the financial statements for the previous month, should be displayed on

the notice board by the end of the meeting, to ensure transparency. Organization Staff should attend the meetings conducted in the villages every month.

8. Annual General Body Meetings

The Members of WPP (beneficiaries) and the committee members should attend the Annual General Body Meeting once a year. The operational, technical and financial details must be discussed in these meetings. Every year, a few new members could be elected into the committee, while retaining some of the old members, as it would

give an opportunity to all the beneficiaries to get elected into the committee and ensure its smooth continuity.

EPILOGUE

Bala Vikasa's Manual, illustrating the Procedure, Guidelines, Who is to do what, Roles and Responsibilities, and providing Guidelines for ensuring Sustainability, has helped Bala Vikasa as an organization, to achieve its specific objectives. However, Bala Vikasa is equally keen to learn from the studies/ research and practical experiences of other NGOs. Sharing experiences would be more helpful in saving time and resources, than re-inventing the wheel.



GLOSSARY

- Beneficiary Members** Beneficiaries of Water Purification Project.
- Committee Members** Committee Members refers only to the Water Committee Members.
- Director** Director refers to the Members of Water Committee, i.e., Members who are not in the capacity of President, Vice-President, Secretary, or Treasurer.
- Medical Practitioners** Medical practitioner refers to those who attend to the health needs of people in the villages. They include both qualified doctors as well as registered medical practitioners.
- Reverse Osmosis Technology** Reverse osmosis (OR), also known as hyper-filtration, is the finest filtration available today. It is the most common treatment technology used by premium bottled water companies. It is effective in eliminating or substantially reducing a very wide array of contaminants, and of all technologies used to treat drinking water in residential applications, it has the greatest range of contaminant removal. Reverse osmosis will allow the removal of particles as small as individual ions.

Arsenic	Bacteria and Viruses	Bad Tastes & Odors	Chlorine	Fluoride	Hydrogen Sulfide	Heavy Metals	Nitrates	Radon	Sediment	Iron	VOC's
●	●	●	●	●	○	●	●	○	●	●	○

● Effectively Removes

○ Significantly Reduces

○ Minimal or No Removal

TDS

Total dissolved solids (often abbreviated as **TDS**) is an expression for the combined content of all inorganic and organic substances contained in a liquid which are present in a molecular, ionized or micro-granular (colloidal sol) suspended form. Dissolved solids refer to any minerals, salts, metals, cations (positive charges) or anions (negative charges) ions dissolved in water. Total dissolved solids (TDS) comprises of inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulphates) and some small amounts of organic matter that are dissolved in water. TDS in drinking-water originate from natural sources, sewage, urban run-off, industrial wastewater, and chemicals used in the water treatment process, and the nature of the piping or hardware used to convey the water, i.e., the plumbing.

WP

Abbreviation for Water Purification

WPP

Abbreviation for Water Purification Program.



Andhra Pradesh Map with development programs

Bala Vikasa is a registered, secular, non-partisan, non-profit, voluntary social service organization in India, working mainly in Andhra Pradesh for a common goal: to help the people to help themselves without distinction of caste and creed.

Bala Vikasa

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