



## User management for sustainable rural water resources

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DRINKING WATER FOR rural households is facing increasing competition. Most of rural populations of Sri Lanka rely on shallow or deep ground water aquifers for drinking water. The recent expansion and development of industry and agricultural sectors have swelled the demand for ground water based industry and irrigation. The rapid development of industry and irrigation depletes ground water resources, resulting in dried up resources of drinking water. This clearly has serious social, financial and institutional implications for the rural drinking water supply, especially where alternative suppliers require more complex and expensive technology.

With regard to the rural water supply schemes, source protection have achieved very favorable results. It has drastically reduced the cost of treatment and improve the quality of water which intern guarantee the improved health conditions of the end users and increase their efficiency and productivity. Unlike in major schemes, in rural sub sector, it is very convenient to carryout source protection programmes, as the capacity and cost involve are very low. Once the source is adequately protected, maintenance of the other components of a water treatment plant also become simple. Therefore, it is understood that water resources protection is an unavoidable component in the rural water supply sub sector if cost effective and sustainable rural water supply schemes are to be developed.

### Community management in rural water resources protection

From a national perspective, community Management in public RWSS services has been negligible until recently. The totally government provided water supply systems have created a culture of dependence in which the water supply system is not mainly perceived as common property. In Sri Lanka, various donors have offered programmes on water supply with the active community participation since 1980. Community participation has been more successful when it occurs throughout the project cycle and it is noticed that participation is not effective when agencies retain control over the details of implementation or when issues concerning physical infrastructure and technology are addressed more effectively than issues of social organization necessary for managing the project works. The forms of user participation vary substantially, ranging from representational committees of users to committees dominated by the rural elite and from direct involvement in construction to supervision of contract.

User management in water resources protection elaborated very significant results. Some of them are identified as follows.

The Government is still not in a position to implement any water resources management programmes alone. Even though existing environmental law has provision to prevent occurrence of pollution of water bodies, there is no suitable observer to watch such incidences. In response more appropriate observing agents would be those who use the water from such sources for their consumption.

On the other hand, the extent or the capacity of the source also has an important role to play. In major water supply schemes catchments are spread covering a larger extent. Organizing preservation activities in such a large extent is an impossible task with community participation. However, in rural water supply schemes, it seems very feasible and easy to implement. Difficulties or obstacles which can be surfaced during the implementation process could be overcome by undergoing community participation or through the bottom up approach. Under centrally management system such an implementation could not be adopted.

### A case study

Extensive catchment preservation programme was carried out in the community managed rural water supply scheme in Kirinda/Puhulwella as a resource management technique. Quality improvement in fresh water, reducing the quality fluctuations and reliability of supply are the achievements in Kirinda/Puhulwella RWSS implemented through the active user involvement. Reduction of treatment cost has reflected in the tariff when house connections are given through the scheme, illustrating the valuable achievement in-terms of cost effectiveness.

### Details of the Kirinda/Puhulwella Source Protection Programme

#### Location

Kirinda/Puhulwella is a Small town situated in Matara District in Southern Province of Sri Lanka.

#### Background

People of Kirinda/Puhulwella were adversely suffered due to lack of water for a long time. Most of the dug wells within and around the vicinity turn dry during the dry period. Sharing of water in wells by groups of families could be frequently seen in Kirinda/Puhulwella during dry periods.

This situation gives rise to;

- Uncertainty on the reliability of well water
- Water quality Fluctuations
- Insufficient Quantity of Well Water

With the inception of world Bank assisted small town water supply programme, the main beneficiary request was to guarantee the reliability of source, provide continuous supply and improve the quality of water at a reduced cost, as the income levels of the recipients were not adequate to bear high tariffs.

#### *Influence of the NGO (Partner Organization)*

- Community mobilization for Kirinda/Puhulwella was done by an environmentally based NGO called “Youth Greenlogists”. In addition it was responsible to create an environment to develop a Community Based Organization with in the community.
- As a NGO, their main concern was on environmental protection in addition to water supply.
- In the Community mobilization activities, “Youth Greenlogists” always paid more attention on protection of water resources, as it was the problem of the area with regard to drinking water. Beneficiaries were inspired by their approach and rallied around the protection of Kirinda/Puhulwella water source.

#### *Catchments Preservation*

- Kirinda/Puhulwella small town had to be provided with water by two boreholes.
- Preservation of the catchments leading to the Kirinda/Puhulwella borehole sources was identified as the most possible and applicable source protection technique.
- First step towards the source protection was recommending a suitable yield to be abstracted, from the boreholes without adverse effects to the environmental conditions.
- It was clearly indicated that severe environmental and social impacts could be generated if the extraction from boreholes are not done carefully. Therefore, controlling of water abstraction should be done scientifically as well as by implementing adequate catchments preservation methods leading to the improvement of bore hole water.
- Secondly, demarcating the boundary of the catchment, which could be lead to nourishment of the recharge capacity of boreholes.

#### *Demarcation of Boundaries*

Boundaries of the catchments leading to the BHs has been identified using the possible fracture patterns of the rock. Expert assistance for same had obtained by the users for this purpose.

Activities proposed by the beneficiary community for preserving these catchment are indicated below.

- Controlling the soil erosion in the sloppy areas by planting appropriate trees, which encourage the rainwater seep in to the ground.
- Controlling the surface runoff by constructing barriers in the hilly areas.
- Educating the people not to uproot or cut down trees meaninglessly within the vicinity.
- Carry out a tree-planting programme covering the catchment.

#### *Participatory Activities*

Under the catchment preservation, following activities were identified to carryout;

- Educate the people in the area  
Display the name boards (Awareness), in order to indicate the catchment area.
- Controlling soil erosion in sloppy areas  
By constructing barriers  
By digging trenches to control and to carry the run off
- Improve percolation
- Prevention of massive excavation of earth in the catchment.
- Planting the appropriate trees in a scientific manner

#### *Advantages of Participatory Process Practiced at Kirinda/Puhulwella*

• User communities and local NGO’s have easy access to the individuals. Therefore, land problems could be settled very easily.

At Kirinda/puhulwella, even though a borehole is situated in a private land, community was able to receive it for the project free of charge. To compensate it, a free house connection had to be provided to the owner of the land. It can also be considered as his contribution towards the project. Under centrally managed system, this could be very time consuming, painstaking and a tedious effort.

- Construction of masonry barriers across the slops and digging trenches also carried out in private properties. Consent of landowners obtained due to participatory approach to execute preservation activities in the respective lands belongs to private owners.
- Dealing with Forest Department directly by the affected community avoids lot of correspondences and meaningless delays. In Kirinda/Puhulwella, CBO/ NGO directly channeled the Matara District Forest Department and incorporated some of catchment preservation activities in to the Community Forestry programme of the Forest Department.

- Maintaining and controlling the possible depletion of ground water table by community forestry activities.
- Avoid artificial recharge for aquifers.

#### *Water Resources Management Under Centrally Managed Systems*

- Under the centrally managed systems, it is very difficult or impossible to carryout water resources preservation activities, as procedures are tedious and complex as well as the extents of catchments are so large or undefined.
- In centrally managed provider systems, catchment preservation could not be a priority as it mostly controlled by demand and supply.

#### *Issues with community participation*

However it was noticed that participation of the community who reside in the catchment of the Kirinda/Puhulwella water resource not up to the expectation initially as they were not the direct beneficiaries of water supply scheme.

This problem has overcome by introducing them with land management methods to obtain more harvest from their lands situated in the catchment. Introduction of small-scale economic crops and fruits with organic farming direct the communities towards new market which expects organically produced fruits, vegetables and spices at higher prices. These communities then participated in all catchment preservation programmes leading to water resources development very actively recognizing an additional value for their lands.

#### **Conclusion**

Experience obtained in the source protection exercise so far elaborate to emerge more meaning-full strategies with regard to cost effectiveness and sustainability of rural water supply schemes. Kirinda/Puhulwella example only provides one model, which illustrate how catchments preservation is adopted with beneficiary participation as an effective water resources management measure. There can be various other scenarios that can be developed leading to this objective, such as adopting wastewater disposal measures in micro catchments, prevention of flowing human excreta in to water bodies etc. It is very clear community awareness and participation has a vital importance to carryout such activities.

On the other hand, it is also important to build up policy framework keeping the provision for water source protection as an essential phenomenon with regard to cost effectiveness and sustainability of rural water supply schemes. Participatory approach in planning and implementing the water resource management activities also need to be addressed.

It is noticed that the model developed to Kirinda/Puhulwella rural scheme could not be effectively implemented in Kaltota, Koslanda or Haliela rural water schemes due to prevailing constraints in location, extent of catchments and type of source climate conditions etc. of those schemes. Therefore, more research to be done in this area to develop effective models on water resources management leading to the sustainability and cost effectiveness of rural water supply schemes.

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