2.12 Mazhapolima: Ensuring water security through participatory well recharge in Kerala

Mazhapolima is a participatory climate change adaptation initiative which was launched by the Government of Kerala in Thrissur district in 2008. The project aims to alleviate the problem of water scarcity by harvesting rainwater from rooftops and feeding it into open dug wells, which traditionally form the water security mechanisms of the state. Active participation of Gram Panchayats, private agencies and beneficiaries led to the installation of over 10,300 Mazhapolima units with government subsidy. The effect of these units on groundwater levels has encouraged more than 10,000 households to adopt Mazhapolima open well recharging systems at their own cost.

Rationale

Kerala has a unique water resources management problem. The state has a large number of perennial springs, streams, rivers and other water bodies and receives an average of 3,000 mm of rainfall in a year. Paradoxically, the per capita availability of water in Kerala is substantially lower than the national average. This is a result of accelerated surface water runoff to sea, which leaves little water for consumption and causes cycles of water abundance and water poverty in the state.

Open wells form a critical part of water supply in the state, with more than 4.5 lakh open wells that contribute 70% of the domestic water supply in Thrissur district alone. Most of these wells run dry in summer. There is also the problem of groundwater exploitation. Thrissur district itself has one over-exploited block (Kodungallur) and four semi-critical blocks (Mala, Mathilakam, Ollukkara and Thalikulam). The district spends more than Rs. 100,000 every year on water tankers, as stated in the WASH-UNICEF Report on Mazhapolima. Further, poor households in rural areas spend on average approximately two hours every day on fetching water. Overall, despite heavy investments in water supply over the years, the outcomes in terms of water quantity, quality and source sustainability have not been commensurate. Successive droughts in Kerala between 2000 and 2004 raised serious concerns about the availability of water and placed conservation and rainwater harvesting high on agenda.

Seeking to tackle the acute water scarcity, the District Collectorate of Thrissur launched Mazhapolima (meaning, bountiful rainfall) in 2008 as a climate change adaptation initiative to augment groundwater resources through rainwater harvesting. Under this model, rainwater from rooftops is collected and filtered before being routed down to recharge open dug wells. This also leads to the formation of a fresh water zone at the source of the dug wells, as shown in *Image 1*. The

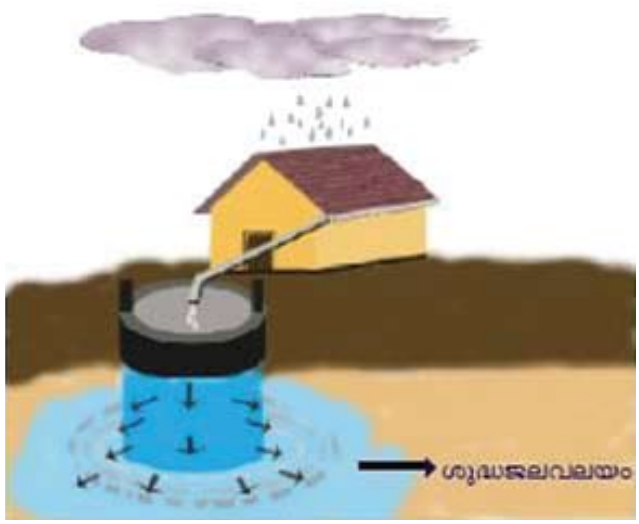

Image 1: Harvesting rain water from rooftops

Source: Mazhapolima: District Rainwater Harvesting Mission

initiative took into account the region's unique geo-hydrological factors: the area receives average annual rainfall of 3,000 mm; open dug wells form unconfined aquifers; there are 200 homestead open dug wells per sq km; the water table goes down in the summer when 75% of the 4.5 lakh wells dry up; and the coastal belt suffers from saline intrusion.

Objectives

Mazhapolima was initiated to enhance the water table and increase water availability in open dug wells throughout the year; improve the quality of water in open dug wells; reduce public spending on water tankers, and reduce saline intrusion into open dug wells along the coastal line.

Image 2: Logo of the initiative

Source: Mazhapolima: District Rainwater Harvesting Mission

Key Stakeholders

There are many stakeholders involved in the project – households and institutions facing water scarcity, the District Collectorate, the District Rainwater Harvesting Mission, the Revenue Department, Arghyam, Panchayati Raj Institutions (PRIs), the Department of Education, the State Planning Board, the Department of Rural Development, the State Bank of Travancore, the Thrissur Pooram City Chamber, and the *Malayalam Manorama* Group.

Figure 1: Key stakeholders

- **Households, institutions with wells facing water scarcity**
- **District Collectorate, Thrissur (Provided administrative support)**
- **District Rainwater Harvesting Mission-*Mazhapolima* (Nodal Implementing Agency)**
- **Revenue Department, Government of Kerela, (Financial Assistance)**
- **Arghyam, Bengaluru (Financial Support)**
- **Panchayati Raj Institutions**
- **Departments of Education, Sanitation, Planning, Rural Development, (Facilitating roles)**
- **State Bank of Travancore**
- **Thrissur Pooram City Chamber (young mens' club)**
- ***Malyalam Manorama* (Media)**

Implementation strategy

Mazhapolima was conceptualised in May 2008 by a group of like-minded conservationists and water activists in and around Thrissur under the leadership of the then District Collector. The draft plan was submitted to the Government of Kerala, where after the Department of Disaster Management, under the Ministry of Revenue, Government of Kerala, sanctioned Rs. 1 crore for the programme. The programme was inaugurated on July 4, 2008 at Thiruvilwamala Grama Panchayath (GP). Demonstration models for the initiative were ready for use by August 2008. After a demonstration of the technique's effectiveness, Mazhapolima's implementation began with the constitution of the Mazhapolima Monitoring and Coordination Unit (MMCU) as a special purpose agency attached to the District Collectorate.

In implementation of the initiative, the process begins with the GP submitting a list of possible beneficiaries. Although priority is given to below poverty line (BPL) households and other deserving categories, the households above poverty line (APL) are not excluded, as this category has more roof area to harvest rainwater. The next step involves an agreement between the GP and a nominee of the District Collector. Thereafter, cheques are issued to the GP and work is undertaken by the Beneficiary Committee at the GP level or by workers directly arranged by the GP. The MMCU helps in making a technical team available for the installation of open well recharge units. A baseline survey is then conducted and a completion certificate obtained from the respective GP member. The MMCU staff conducts a valuation of the work done by technical teams and recommends issuance of funds if the installation is satisfactory.

Beneficiary contribution to installing Mazhapolima unit:

- ❖ Participation in the form of labour for cleaning the roof and well
- ❖ Participation in maintaining the pipe and gutter system for open well recharging

The initiative is being implemented in phases and improving over time. For example, in the first phase (July 2008-January 2013), the selection of wells for recharge was primarily handled by GPs and done at random. However, by the end of Phase I, when the impact of the initiative became visible and came to be appreciated, many more people came forward to adopt it. The second phase (February 2013–January 2016) has entailed scaling up of the initiative to other districts and the adoption of a cluster approach instead of the random approach adopted in Phase I.

Mazhapolima has clearly demonstrated the ability to respond to a common need with a simple but effective solution that covers four key components – innovation, awareness generation, grievance redressal and trainings.

Details of the pilot project

In Phase I, a pilot was conducted in Thrissur district's Kodungallur block, which was marked as a groundwater over-exploited block. The pilot was implemented in all 3 GPs of the block. More than Rs. 40 lakh were spent in installing approximately 2,300 units, resulting in an improvement in water level and helping the block move up from the 'over-exploited' to the 'critical' category.

a. Innovation

The concept of rainwater harvesting is not new. However, the participatory model of implementation under Mazhapolima and the convergence of the efforts of various agencies and actors are innovative. The major innovative strands under this initiative include its PRI-centric, participatory approach to rainwater harvesting; creation of a dedicated unit at the district level to assist GPs in technical implementation; extension of the initiative to various government and private institutions; convergence of existing government schemes such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme, Integrated Watershed Management Programme (IWMP), and Western Ghat Development Programme; and encouragement of private investment in cash or kind to ensure ownership of the initiative by the beneficiary. Government assistance is provided only to Scheduled Caste (SC), Scheduled Tribe (ST) and BPL beneficiaries.

b. Awareness generation

The drought of 2004 was the immediate trigger that escalated the issue of water conservation and management to the top of the public agenda. While efforts were being made by the district management to meet this crisis, the vernacular media, especially *Malayalam Manorama*, launched a dedicated campaign on the issue of water conservation called Pala Thulli (many drops) in Thrissur district, which propagated various means of achieving a new water culture. For more than a year, the newspaper dedicated a page to the Pala Thulli campaign, organised seminars and workshops, held exhibitions and video shows, and distributed booklets. These efforts were especially targeted at the youth, and created an unprecedented awareness on the subject. The newspaper also announced a Pala Thulli Award for outstanding work by institutions in water conservation.

The awareness generated by the programme can be gauged by the fact that more than 300 entries competed for this award. Similar dedicated efforts were initiated by various civil society actors, including conservation efforts by the Thiruvananthapuram -based NGO Planet in 2006-2007. The Jalanidhi programme aided by the World Bank set the backdrop for Mazhapolima. The Jalanidhi programme was designed to assist the Government of Kerala in improving the quality of rural water supply and environmental sanitation service delivery to achieve sustainability. Jalanidhi made the administration more receptive to ideas of water conservation and sanitation, which helped Mazhapolima secure the requisite administrative support for implementation.

After the adoption of Mazhapolima by the District Planning Committee of Malappuram district, efforts were made to create awareness by involving GPs as well as Panchayat-level personnel such as anganwadi workers (AWWs), auxiliary nurse midwives (ANMs), accredited social health activists (ASHAs), religious and charitable agencies, clubs, schools, Kudumbasree, and the local resource team. The aim was to involve all these stakeholders in taking the message across to households that had open wells. The Information, Education and Communication (IEC) programme was well received in the community and many were motivated to adopt the initiative using their personal resources, without waiting for government subsidy. This enhanced the sustainability of the initiative.

The awareness generation methods used by the programme include:

- Seminars and classes to local governments and groups
- Distribution of leaflets and posters across schools and government institutions
- Exhibitions
- Teacher trainings
- Media coverage through newspapers, TV channels, local magazines
- Media workshop
- Workshop on Millennium Development Goal (MDG) 7 – ensuring environmental sustainability; water community workshop
- Training to local self governments by the Kerala Institute of Local Administration, Agriculture Extension Training Institutes (Thrissur) and Institute of Management (Trivandrum)
- Answering queries on open well recharging over telephone
- Filming documentary on Mazhapolima

c. Grievance redressal

The initiative does not currently have a separate complaint or grievance redressal mechanism, but since it is implemented through GPs, people take their grievances to the Panchayat representatives and members. Beneficiaries can also contact the Mazhapolima office with their technical complaints.

d. Trainings

Capacity building has been identified as a key component for the successful implementation of the Mazhapolima initiative. However, this has not fully taken off. For example, staff training has been held only once since the inception of the initiative.

Resources Utilised

As the GPs act as the nodal implementation agency for Mazhapolima, the existing resources of PRI institutions were utilised for it. The administrative cost of the MMCU was met with the funds provided by Arghyam to support the programme.

The Government of Kerala sanctioned Rs. 1 crore to the programme, while other agencies such as Kerala Water Authority, and National Bank of Agriculture and Rural Development (NABARD) provided some financial support. The funds available to Mazhapolima from all sources in Phase I totalled Rs. 2,10,32,000.

Setting up MMCU required some human and material resources. Infrastructure for the unit was borrowed from the Jalanidhi project aided by the World Bank. The unit had seven personnel – Director, Liaison Officer, Programme Officer, Field Coordinator, Community Organisers (2), and Accounts Assistant.

Mazhapolima - funds received so far

- Rs. 3 crore from Government of Kerala
- Rs. 1.3 crore from Arghyam Trust, Bengaluru
- Rs. 80 lakh from rural local governments
- Nearly Rs. 14 crore through MGNREGA, IWMP and other central schemes
- Rs. 1 lakh from banking institutions and the private sector
- Rs. 20 lakh under District Innovation Funds

Mazhapolima – costs incurred (10,000+ units installed

- Per unit cost (maximum possible) is Rs. 4,500
- (Rs. 3,375 + Rs. 1, 125 beneficiary contribution)

Techniques used in Mazhapolima

Mazhapolima units adopted two types of techniques. One technique is roof-top harvesting with sand filter, where PVC gutters are fixed to collect roof-top water, which is then diverted to the filter using a PVC pipe. The filter consists of sand, metal and charcoal. This technique costs Rs. 2,500-3,750 per unit. The second technique is roof-top harvesting with ordinary nylon filter, through which the roof-top water is harvested and diverted to the well through a nylon or cloth filter using a PVC pipe. This option reduces the cost to Rs. 1,250-2,500 per unit.

Impact

Strong public interest in setting up Mazhapolima units: The active participation of GPs, private agencies and beneficiaries led to the implementation of about 8,056 Mazhapolima units in 58 GPs by December 2012. By January 2014, more than 10,300 Mazhapolima units had been installed with government subsidy. The positive effect of these units on groundwater levels has encouraged more than 10,000 households to adopt Mazhapolima open well recharging system at their own cost.

Improvements in water quality: An impact assessment study by the Centre for Water Resources Development and Management, Kozhikode, revealed a decrease in pH levels in the water collected from the recharged area. Moreover, the salinity level of the water collected from recharged wells in the coastal region is relatively low compared to samples collected from non-recharged areas.

However, the recharged water showed a high level of bacteriological contamination, hinting towards leach pits near wells or non-functional filters. The assessment also showed that the draining of groundwater in steep slopes is much faster than in gentle and moderate slopes. This finding suggests that to retain the harvested rainwater for a longer duration, areas with gentle to moderate slopes should be selected for Mazhapolima units.

Key Challenges

There were several challenges in the implementation of the programme, especially from the beneficiaries. Low attendance at meetings, for instance, has been one

challenge. Likewise, beneficiaries have not taken care of the flush systems nor installed filter systems. There have been instances of mixing of wells with toilet leach pits that has reduced the effectiveness of the filters.

Another challenge has been with regard to generating agreements among family members on directing rainwater to open dug wells. There has also been resistance for perceived change in the taste of water after recharge. Likewise, removal of pipes or breakages have been reported in the case of 25% of the beneficiaries. Beneficiaries have also been complacent about water supply after abundant rain, coupled with low hydrogeological literacy among the new generation. It has been felt that the rapid pace of unit installation reduced scope for participatory learning.

Some other challenges related to the fact that the initiative was being implemented through PRIs, who preferred short-term solutions like tanker supply during summer. Panchayat members often sought equal shares for their respective wards, making it difficult to adopt a community cluster approach. This inadvertently reduced the scope for participatory approach, making the recharge units more like demonstration models in some target areas.

Replicability & Sustainability

As a water management model, Mazhapolima is suited to both the east areas and west coast of Kerala. The technique used is simple to adopt and the financial implications much lower than providing tanker supply to drought-hit areas each year. So far the effort has concentrated on Thrissur district, but the impact generated is beginning to attract other districts to this initiative. The Mazhapolima initiative has been scaled up in Malappuram, where Mazhapolima rainwater harvesting units are being installed in five block Panchayats. The conditions necessary for replication of the programme are good rainfall and a culture of open wells, as household-level wells have the additional advantage of working as micro-aquifers. Except in certain hydro-geological typologies, most of the

Monitoring of water quality

The project includes a component of action research in which water quality and quantity at source is being monitored regularly for the past two years. Water level monitoring is done every month, and water quality is checked in 67 cases from across the district and from the action research sites of the district, which includes coastal sandy area, mid lands and up lands.

People speak...

Baby, Manaloor Gram Panchayat

"Earlier the water was slightly yellowish in colour and turbidity was high - the water was *heavy*. We didn't have any salinity issues. This is the third year running. We didn't have to make any financial contributions for installation. Everything is done by the Panchayat. We clean the pipes and channels."

Surjit, President, Manaloor Gram Panchayat

"This is a very successful project – not 99 but 100%. In all houses, which have wells, this must be made compulsory by law. There are 600 households in this Panchayat. Panchayat plan funds have been used for the past 2-3 years. In 2013-14, MGNREGA funds were used for works in 380 units. Initially, we had to hunt and convince people of the advantages of this project but now there is sufficient demand after seeing the experience of others. People recognise the name Mazhapolima now."

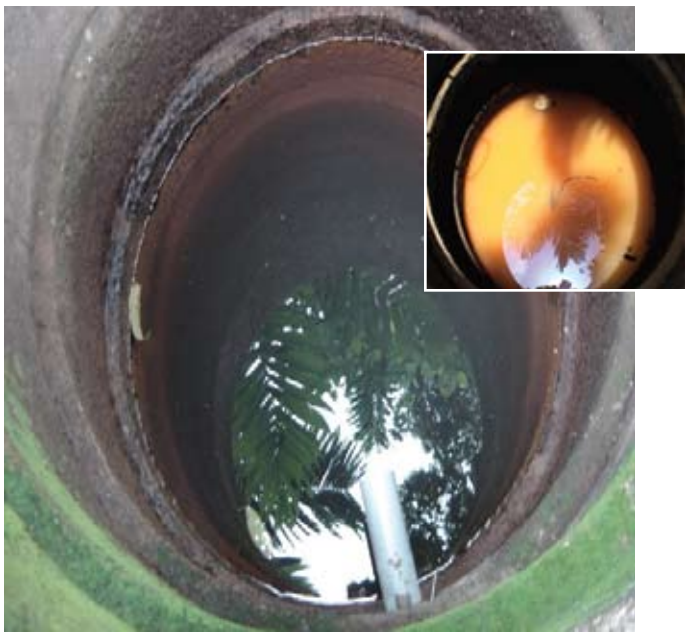

Image 3: (Inset) well before the recharge and well after the recharge

Source: Mazhapolima Monitoring and Coordination Unit, Thrissur

coastal locations in India fulfill these conditions. Hence, Mazhapolima represents a low-cost, effective climate change adaptation strategy.

Conclusion

Mazhapolima has importance in the light of the drastic and dramatic global climate change scenario. One of the sustainable ways to deal with the threat is to embrace adaptation mechanisms that reverse or at least limit the adverse impact of climate change. Such initiatives are the need of the hour, even if the pace of change and adoption is slow initially. Seeing Mazhapolima's success, the Government of Kerala has recently sanctioned Rs. 2 crore to further strengthen the rainwater recharge programme. Of this, Rs. 1 crore will be used to construct 20 check dams in the drought prone blocks so that the harvested water can percolate down to recharge open wells in lower regions. The remaining Rs.1 crore will be sanctioned to 59 local self-governments to implement the Mazhapolima programme. The beginning of a new water culture in Kerala has indeed been made.

Fact Sheet

Theme	**Environment**
Nodal Implementing Agency	**District Rainwater Harvesting Mission - Mazhapolima, District Collectorate, Thrissur**
Geographical Coverage	**5 Block Panchayats in Thrissur district and Malappuram district of Kerala State**
Target Groups	**Households and institutions with wells**
Years of Implementation	**2008 - Present**