



REGIONAL INTEGRATED RAINWATER HARVESTING IN HOSADURGA TALUK

1. Background:

Hosadurga is one of the worst drought-prone taluk in Chitradurga district. The main economic base for the taluk is agriculture. The locally cultivated crops are coconut, raagi, groundnut, sunflower, onion, chilly, jowar, cotton etc. Agriculture, here, is totally depended on rain. The successive failures of monsoon and the lack of proper resource management had affected the livelihood of farmers. The rains failed during the years 2000 to 2003. It created immense pressure on the local body to supply water.

The Government of Karnataka had declared Chitradurga district as a highly drought-prone area. The Hosadurga taluk was facing both economic and social problems. In such a situation, the state government released funds through the respective Deputy Commissioner for supplying drinking water, installation of hand pumps and construction of open wells. The expenditure was nearly Rs.1510622/- and Rs.615000/- respectively during the years 2002 & 2004. Hosadurga taluk has also utilized the scarcity funds from both State as well as Central Government effectively. It has built a series of check dams and bunds for storing rainwater. This is a joint effort of the elected representatives, Town Municipal Council (erstwhile Town Panchayat), Zilla Panchayat, Watershed Department and farmers of Hosadurga taluk.



Location Map

Taluk Profile

Area	: 1616.40 Sq km
Gram Panchayat	: 33
Population	: 219311 (2001 census)
Population Density	: 136 persons per Sq km
No. of Households	: 43890 (2001 census)
Total Literacy	: 57.26%
No. of Villages	: 226

City Profile

Area	: 2.5 Sq km
Population	: 22,488 (2001 census)
Revenue Wards	: 23

2. Situation prior to the Initiative

Hosadurga taluk was facing acute shortage of water due to lack of sufficient rains during 2000-2003. On account of water scarcity, there was less cultivation and productivity. It affected the economic growth of the entire taluk. As Hosadurga is surrounded by rocky hills, high run-off is witnessed during rainy season. The bore wells in the taluk failed and ground water table started receding. There were instances where the water table was below 300 ft. The failure of hand pumps created a lot of problems to the people even for their daily activities like drinking, bathing, washing clothes etc. Water was not available even for animals to drink. This had put immense pressure on the Town Municipal Council to supply water to all the people. Nearly an amount of Rs.1510622/- was spent by the Town Municipal Council for supplying water through tankers to the people of Hosadurga during the years 2002 to 2004.



The land is dry as there is no water retention in the soil

Apart from the above problems, there were other issues like social problems and fights between people over water. This created an unhealthy environment.

Table 1: Details of money spent on construction of open wells, water tanks and purchasing of hand pumps, motors, etc.

Office	Date of release	Amount released (in Rs.)
Amount released from DC's office to Town Panchayat	5.11.01	3,80,000.00
	3.03.03	60,000.00
	3.03.03	1,25,000.00
	23.03.03	50,000.00
Total		Rs. 6,15,000.00



Water supplied through tankers due to water scarcity

Table 2: Details of money spent on supplying water through tankers during 2002 & 2004

Office	Date of release	Amount released (in Rs.)
Amount Released from DC's office to Town Panchayat	29.02.02	50,000.00
	24.09.02	67,175.00
	25.04.03	2,00,000.00
	17.05.03	1,00,000.00
	04.06.03	2,00,000.00
	19.07.03	3,00,000.00
	22.09.03	3,00,000.00
	22.11.03	2,00,000.00
	17.03.04	10,000.00
	15.04.04	50,000.00
	25.07.04	33,447.00
Total		Rs.15,10,622.00

Source: Town Municipal Council, Hosadurga

All these problems made the Hosadurga MLA¹ to give a serious thought to initiate rainwater harvesting (RWH). It was decided to take the help of various departments like Town Municipal Council and Watershed Department. Participation of people was also encouraged in implementing the RWH initiative. Hence, this initiative is a result of the combined effort of elected representatives, various departments and citizens with the help of State and Central Government funds.

3. Objectives and Aims

As Hosadurga taluk is agriculture-based, water is one of the key requirements for the livelihood of the people. Water problem for 3 to 4 consecutive years led to a very high demand for it. Hence proper management of water through RWH was the only solution. Therefore people of Hosadurga along with the MLA and various departments wanted to harvest rainwater. They collected rainwater by stopping the run-off during the rainy season, stored the collected water for groundwater recharge and prevented soil erosion through participatory planning and management.

To achieve these objectives, the MLA in co-ordination with all the departments like the Town Municipal Council, Zilla Panchayat, Watershed Department and Minor Irrigation Department, planned the implementation strategies. Funds of about Rs.304.94 lakh and Rs.102.98 lakh were sponsored by the Central and State Government respectively through various schemes.



The Check Dams and Water Ponds constructed to harvest Rainwater

Table 3: Name of the Schemes of State and Central Government

Sl.No	Schemes of State Government	Schemes of Central Government
1	25% amount through Jalanayana Scheme and World Bank	75% grant through Jalanayana Scheme (Watershed department) and World Bank
2	Scarcity funds sponsored by State Government	Work for food scheme
3		DPAP scheme

Source: City Municipal Council, Hosadurga

To utilize the funds from the above schemes, a series of meetings were held with various departments and regular meetings were also held with the farmers. Farmers met in the panchayat every Saturday in Bagoor village to discuss and arrive at a solution for water problems in the entire taluk.

Hosadurga Taluk comprises of 188 revenue villages and 159 hamlets. Out of these, 80% of the area constitutes the agricultural land. So it was difficult to identify the locations of the catchment areas for the construction of bunds and check dams. The farmers from each of the villages came forward and gave suggestions to the MLA and the officers regarding the location and extent of the catchment areas, as they were aware of the local conditions.

After taking the suggestions from the farmers, the MLA and officers personally made field visit along with the farmers. Then they finalized the location for the construction of bunds and check dams. Once all the locations were identified, the work plan was prepared. The series of check dams are connected as cascades to ensure water retention in each of the check dam.

Nearly 200 Mini ponds, 50 Bunds and 86 Check dams have been constructed so far through the Watershed Program. It covered an area of about 1, 44, 000 hectares (cultivable land) and targeted 1, 23,000 hectares of land for the coming 3 to 5 years. For the RWH, a further 2, 75, 000 hectares of land will be used in the future projects.



View of a water body that was constructed using the funds from Pradhana Manthri Gram Sadak Yojane. Here the depth of the water body is around 20 mts. Water is collected up to the level of the barrage; when it is full, it over flows to the connecting check dams. This project serves both the purpose of a road as well as barrage to collect and store rainwater.

Apart from initiatives by Government, there are NGOs who are working towards the same cause, educating the farmers on the benefits of RWH. NGOs are helping farmers in construction of percolation tanks depending on the land availability.

There are additional efforts that are being made by the Watershed Department with the help of local farmers, like planting trees of local species in non agricultural Government land. So far nearly 3500 trees of various local species have been planted in 15 acres. Farmers are also being educated about the benefits of mixed cultivation.



Table 4: List of some of the projects undertaken in Hosadurga Taluk, for RWH

Name of the place	Approximate amount in Rupees	Name of the scheme
Hagala Kere - Renovation of bund	2,00,000	Scarcity fund 6, 7 th phase
Alagatta - Construction of Check dam	1,75,000	Scarcity fund 6, 7 th phase
Gokatte - Construction of Check dam	2,00,000	Scarcity fund, 2 nd phase
Kyadige halli pond - Renovation of bund	1,00,000	Scarcity fund 6, 7 th phase
Somena Halli - Construction of Check dam	3,50,000	Scarcity fund, 8 th phase
Suduqadanapalya - Renovation of bund	1,00,000	Scarcity fund 6, 7 th phase
Sri. Rampura Holeya - Construction of Check dam	1,50,000	Scarcity fund 5 th phase
Mailaripura - Pond renovation	1,00,000	Scarcity fund 6, 7 th phase
Nanjayanna kere - Renovation of Check dam	5,00,000	Scarcity fund 4 th phase
Marakatti - Renovation of Check dam	10,00,000	Scarcity fund 1 st and 2 nd phase
Malappanahalli - Construction of bund	5,92,000	Scarcity fund 8 th phase
Mathodu - Construction of Check dam	2,50,000	Scarcity fund 3 rd phase
Bhukka sagara - Construction of bund	5,96,000	Scarcity fund 6, 7 th phase
Gollara Halli - Renovation of Check dam	1,00,000	DPAP, 2003 - 04
Mengasandra - Construction of bund	3,37,000	DPAP, 2003 - 04
Vajrada halli - Construction of Check dam	1,50,000	Work for food scheme 5 th phase
Sadara Halli - Construction of Check dam	1,75,000	Scarcity fund 6, 7 th phase
Chikkathekalavatti - Construction of bund	2,56,000	Scarcity fund 1 st phase
Sri Rampura near Eid - Construction of bund	1,00,000	Scarcity fund 4 th phase
Sujikallu - Construction of Check dam	1,92,000	DPAP, 2003 - 04
Near Yaramballama temple - Construction of Check dam	1,30,000	Scarcity fund 5 th phase
Kadadhina Kere - Construction of Check dam	8,00,000	Scarcity fund 4 th phase
Korati kere - Construction of Check dam	7,50,000	Work for food scheme 3 rd phase
Konguvalli - Construction of Check dam	2,75,000	DPAP, 2003 - 04
Aaladha Halli - Renovation of bund	4,00,000	Work for food scheme 2 nd phase
Malali - Construction of Check dam	7,50,000	Work for food scheme 2 nd phase
Kappagere - Construction of Check dam	5,00,000	Scarcity fund, 2 nd phase
Aathimogge - Construction of Check dam	4,00,000	Scarcity fund, 5 th phase
Rangavvana Halli - Renovation of bund	1,20,000	Scarcity fund, 3 rd phase
Nagayvana Hatti - Construction of bund	3,00,000	DPAP, 2003 - 04
Aathigatta - Construction of bund	3,67,000	Scarcity fund 6, 7 th phase
Belagooru - Construction of Check dam 1	2,00,000	Work for food scheme 3 rd phase
Belagooru - Renovation of bund 2	1,00,000	Scarcity fund 3 rd phase
Heggere Halli - Construction of bund	1,50,000	DPAP, 2003 - 04
Renovation of Dhore Bhavi near Heggere Village	1,00,000	Work for food scheme 4 th phase
Harala Halli - Renovation of bund	4,00,000	Work for food scheme 6, 7 th phase
Renovation of Hosooru bund	1,50,000	Work for food scheme 3 rd phase
Kare Halli - Construction of Check dam	2,00,000	Work for food scheme 4 th phase
Shivanne Katte - Construction of Check dam	1,00,000	Work for food scheme 3 rd phase
Nagenahalli - Renovation of bund	50,000	Work for food scheme 2 nd phase
Dasenahalli - renovation of bund	1,00,000	Work for food scheme 6, 7 th phase

Source: Zilla Panchayat Office, Hosadurga

4. Strategies adopted and Implementation Process

To implement the project, following steps were followed:

a) Awareness Programs

Several workshops were held in the villages of Hosadurga taluk to educate people about RWH. During the workshop, posters and pamphlets in local language were distributed to people for better understanding.

On every Saturday, people used to gather for a panchayat meet in Bagoor village to discuss the problems of water. It helped them to plan effectively the program of RWH.

Street processions were also held to motivate the people of Hosadurga taluk to support the RWH initiative.



Recently, people of Hosadurga are also being educated on rooftop RWH.

Several interactions of this kind have helped people to plan better for the implementation of RWH.



b) Identification of catchment areas

The catchment areas were determined based on the contours. Farmers from the villages of Hosadurga taluk played an important role in identifying the points for storage or recharge.

c) Site Visits

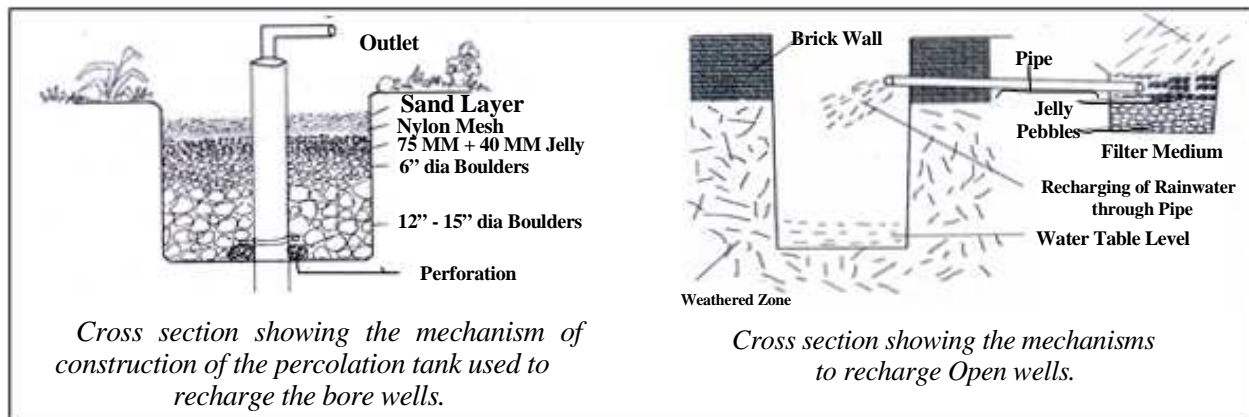
The officials of various departments along with the MLA visited the identified points and locations of rainwater recharge and technically evaluated them.

Hydro-geological surveys were conducted to determine the groundwater extent at places, where there are hard rocks.

Extent of area to be included was decided, as major cost in RWH is spent in storing the water. Deeper ponds make better storage. Optimizing the cost was very much necessary for better utilization of funds.

d) Project Planning

- Preparation of technical drawings
- Analysis and allocation of funds to various projects like construction and renovation of check dams and bunds through out Hosadurga taluk.
- Approval of the project proposal by various departments.
- Execution of the project by Watershed Department, Minor Irrigation Department, Zilla Panchayat and Taluk Panchayat.



Source: Book on "Recharge Mechanisms for open wells and borewells" by N.J. Devaraj Reddy, Chitradurga

5. Situation after implementation of initiative

Problems Faced

- Political interference from different parties delayed the implementation of RWH.
- Coordination with various departments delayed construction of check dams.
- The farmers resisted the idea of construction of bunds initially. Motivating them to a common cause was a tedious process.

Lessons Learnt

- The officials and elected representatives realized that peoples' participation in identifying the catchment areas was one of the major benefits of RWH.
- It was also realized that awareness programs in the form of workshops, meetings, distributing posters and pamphlets, etc helped in successful public participation. People were involved in decision making to execution of the RWH projects.
- Co-ordination between departments was very important for the successful implementation of this project in the entire taluk.

- Implementation strategies have to be planned earlier and needs to be verified at every stage for effective results.
- Proper utilization of available funds through various schemes from Central and State Government helps in creating assets, which could be used even in future.
- Regional scale RWH eventually helps the town municipality too, as the groundwater gets recharged.
- Therefore, RWH in some cases, have to be looked beyond the physical boundaries of a town/ urban areas.

Resource Mobilization

The resources for the various RWH projects, which were implemented in Hosadurga, were due to the effective utilization of funds from various government schemes.

Table 5: Details of Funds from Both State & Central Government

Schemes under State Government	25% amount through Jalanayana Scheme and World Bank. Scarcity funds sponsored by State Government
Funds from State Government	Total amount of funds received from State Government so far is Rs. 102.98 Lakhs
Schemes under Central Government	75% grant through Jalanayana Scheme (Watershed department) and World Bank Food for work scheme, DPAP scheme
Funds from Central Government	Total amount of funds received from Central Government so far is Rs. 304.94 Lakhs

Total amount spent on RWH initiatives in Hosadurga so far is nearly Rs.411.92 lakh

6. Outputs and outcomes

The results achieved in Hosadurga Taluk on implementation of RWH schemes are as follows:

- Rainwater harvesting has helped the people of Hosadurga taluk to overcome the problems of water required for their daily activities like drinking water for humans and animals, washing, bathing etc.



- On a regional scale, construction of series of check dams and bunds has helped to recharge the groundwater. As a result of this, bore wells and open wells which were dry for 2-3 years, are recharged. Water is now available in bore wells at a depth of 30- 60ft.
- Construction of a check dam increases the groundwater level in turn retaining water in the soil; hence ploughing the land became easier for the farmers.
- Increase in groundwater level has helped agriculture. It resulted in better yield of various crops and brought economic prosperity.



- RWH has minimized the storm water run-off and soil erosion in most of the places.
- Problems such as entry of wild animals into the village for drinking water have decreased after implementing RWH, as water is available at the foot of the hills.

7. Sustainability

The rainwater harvesting initiative is economically sustainable as the investment made in the project has helped to solve the economic problems of the local bodies. It has helped to create assets in the form of check dams in the catchment area affecting the groundwater level. The entire taluk including Hosadurga town is reaping the benefits. RWH initiatives have helped in solving the taluk's basic necessities as well as aiding agriculture which constitutes a major activity in the taluk. Water management in the near future is going to be one of the important areas of concern. But Hosadurga has already taken the first step in solving the water problem.

The participatory approach was adapted by the officials, political class and the people of Hosadurga taluk. Involvement of the farmers in the project has created a sense of belonging in every citizen. During the process of implementation of this project, every citizen of the taluk has realized that working together in a group helps in achieving the impossible. Other social issues of violence arising from water scarcity have also vanished eventually.

The technique involved in collecting rainwater is simple and easy to understand for all. Simple idea was to collect rainwater in the catchment areas throughout the taluk. It identified the contours of the entire area. The soil condition of Hosadurga taluk, which is sand mixed with gravel, supports good percolation of the collected rainwater. Apart from this, construction of many percolation tanks, check dams and bunds have increased the groundwater level. It gave life to most of the open wells and bore wells in the taluk.

8. Potential for replication

Rainwater harvesting is practised over 25 countries and is the future of sustainable water management strategy. If the initiative is implemented in a phased manner there are possibilities of achieving a value nearing zero runoff. This initiative is easily replicable in other districts of Karnataka with proper coordination among urban local body, concerned Government departments, elected representatives and the people.

In agriculture based town, where availability of land is not a major constraint such an initiative can be very successful. Hence rainwater harvesting, if taken up on a regional level will help larger groups of people. In this regard the initiative in Hosadurga Taluk stands as an example in the state of Karnataka.