

Project Completion Report

Title of the project	:	Integrated Campaign for Drinking Water and Water Saving Technologies in Wangjing River Basin
Amount supported by IWP	:	Rs. 26,910/-
Location	:	Wangjing river basin of Thoubal district in Manipur.

Introduction:

Under the support of India Water Partnership, New Delhi, the Wangjing Women And Girls Society (WWAGS) has undertaken a Research project on low cost water saving technologies under the title “Integrated Campaign for drinking water and water saving technologies in Wangjing river basin”. The main objective of the project is to streamlining and strengthening is the process of river basin management for sustainable use of water in the basin and find out a technology in water saving for sanitation. The concept of water saving technologies came in the mind of policy makers due to the recurring occurrence of water scarcity problem in the river basin environment of Wangjing river. The basin is beset with serious water related problems which have led to extreme hardship to the local people thereby resulting to conflict between water users as the river is the single most important water resources in the area. The problems are getting worse in the absence of a comprehensive water management plan and a proper institutional system to manage the water resources. The research project was started in August, 2009 focusing in two development aspects;

- Promotion campaign on drinking water
- Ecosan as water saving technology

Source of water:

Study of the river resources reveal greatly devastated catchments areas. The existence of the river is maintained mostly by three conserved forests in the catchments namely the Bungli, Khajinglok and Ishingthingbi respectively. There are 7 important tributaries/gorges of the river in the short course of its origin. Out of these, only three tributaries are contributing through out the year namely Bumi, Khajinglok and turel Macha and other gorges contribute in monsoon season and these contribute to flash floods. The khajing lok forest is preserved by the local people of Machi village and biotic resource is kept intake since fishing and other activities of quarrying has banned in the area.

Rainfall and temperature records for the last 10 years:

The rainfall data shows the high rainfall in the river basin. But there is still water scarcity problem in the area due to lack of proper management of water resource in the basin. The detail information is attached in annexure.

Water quality

As the deterioration of water quality in the river is directly related with the mere availability of drinking water in the villages, a focus group meeting has organized at Wangjing . The focus group meeting has been attended by the members of Village level water users Committees, academia's, farmers and representatives of women associations of the river basin. It is aware that the Wangjing river basin environment has been deteriorated in a considerable extent.



The main issues discussed in the committees meeting are-decreasing lean season flow, the shortage of water during the lean season, inappropriate ways of using available water and absence of proper institutional system to manage water resources. WWAGS contacted the senior scientist from the Environment and Ecology Wing (EEW) Imphal and requested them to conduct the Microbiological test in 3 ponds of Chingtham village. The report of the test indicates the coliform and faecal contamination of water in large scale.



Open toilet

But as we observed that the community ponds in Manipur are the major source of drinking water and also traditional practice of rainwater harvesting system. The presence of coliforms and fecal bacteria indicate that the water in the river basin environment is largely affected by non proper maintenance of toilets. The detail report of the test is attached in the annexure. Women are very specific in mentioning that there is no inclusion for needs of the domestic use of water in any planning process and they would want to specify and add **Domestic Water use** on a priority as there is sanitation management problem in the areas.. On the other hand, there is increasing water pollution in the river. Water quality is considerably bad. The situation is more complex during summer season when the flow of water is less. The water is highly turbid during monsoon due to siltation. The water is very clean for a short period of time just after monsoon and begins to deteriorate gradually. The river in the lean season is highly polluted with biodegradable waste, ashes, soaps and faecal matters to an extent that at certain times it is not suggested for using it for bathing. Microbiological pollution is much expected and is revealed by the occurrence of water borne diseases in the area. Chances of pollution with pesticides and insecticides remain during peak of cultivation periods. Men are more concern with the need of water for agriculture. Pouring of waste garages and household dirty matters, bathing of both men and animal, washing after defecation on the bank are daily prevalence. Defecation along the river bank is a common scenario. For drinking purpose, dug out wells of around one or two feet deep on the river bed just near the main water flow is used all along the course. Rearing of animals such as pigs, ducks etc, are common. These animals get free access into the river at the instance or interest of the people who rear them. For piggery it is seen in the upper course and for duckery it is seen in the lower course.



Village rs wash clothes in the river

Water sharing:

Heirolk village in the upstream get the lion share and use it for irrigation and domestic purposes. The canals and MI dams locally constructed ones are looked after by paid farmers appointed to do so. Getting water by remote villages is a matter of luck and investment. The government water supply facility in the areas is very insufficient. As reported during the discussion, the river water is diverted to the periphery villages such as Khongjom, Chingtham and Samram which are situated in the southwestern direction from Heirolk village for irrigation and drinking purposes. As there is continuous diversion of water in these villages, the people in the lower course are not getting enough water for the same purpose. As such, sometimes, there are conflicts among the people of upstream and downstream villages regarding the sharing of water.



Ecosan as a Water saving Technology.

The concept of eco-san construction in the Wangjing river basin villages came in the minds of Executive members of WWAGS for the last decade for the following reasons;

- Drying up of springs, rivulets in the upper areas leading to acute water stress in the hill catchments and plain areas.
- Water flow in the lean season is too low which causes acute shortage of irrigation water for agriculture and drinking
- Deterioration of water quality is high due to discharge of pollutants in the river.
- Open defecation along bank of the river and construction of toilet helped discharged faecal liquids in the river or ground water.

The situation is more complex during the summer when there is no water flow in the river. The construction of toilet near the water bodies helped discharge the waste liquid in the water. Traditional practices of open defecation is highly affected both surface water and groundwater in some extent. As Ecological sanitation (Eco-san) was chosen as a water saving technology in context present challenging drought like situation which have been occurred in the last 3 to 4 years. Under the generous support of Arghyam, 15 Eco-san were constructed in the area address the local sanitation problems. Eco-san is a sustainable and environment – friendly option for on site sanitation, which conserves water, prevents contamination and recycles human wastes as sanitized manure. The objective is to protect human health and the environment while reducing water use in sanitation systems and recycling nutrients to help reduce the need artificial fertilizers in agriculture.



It is a three step sanitation process of containment, sanitation and recycling of human excreta. Sanitation is achieved through dehydration and decomposition.

- The Eco-san toilet consists of two chambers built on a concrete slab.
- The chambers are covered with an RCC slab with a hole over each chamber for the faces to drop in and a funnel like arrangement to collect urine.
- After defecation some materials like wood ash, lime, sawdust and soil are added to cover the faces. It takes an average family, six months to fill one chamber.
- The second chamber is then used. The first chamber is emptied after another six months when the second chamber is full.
- The contents are then stored and used as manure.
- Urine collected separately in a can is diluted and uses as fertilizers.

Eco-san gives benefit in three ways:

- Less water is used.
- It allows reutilizing of nutrients in agriculture giving better yields and reducing water use.
- It gives minimization of water base infections/diseases.
- It is not polluting water or soil, because the faces are kept in the watertight chambers. Even if the ground around the toilet is flooded, faces will not get in connection with the water.
- It is improving environmental sanitation by converting faces to manure. .
- The human waste is safely disposed of by the user of the toilet.

After 6 months of using ecosan, there were complaints of inconveniences while using ecosan with the following points;

1. inability of separation of urine and excreta in case of women
2. wants more water for cleaning neck of the excreta hole.
3. vertical pushing up of unpleasant smells from the excreta tank
4. inconvenience of using for aged persons and children

These issues had been discussed with the beneficiaries. Necessary advices had also been given to the users to apply a balance wood ash after defecation. Some drops of water might fall in the tank but it could be managed with the wood ash or dry soil after used. Excreta hole covers were suggested to prevent falling water in the pit. Children and aged members had also been given advice to follow the instructions of using ecosan.



Considering the above given points, an ecosan was designed at Wangjing village under which the rectangle shape of earlier was replaced by round and oval shape and filter chamber for back waste water was added. Under this designed the cost of ecosan was reduced to Rs.9500. Due to difference in human anatomy between male and female, some drops of urine was fallen in the pit when women used the toilet. Excreta hole cover was suggested under the research project to avoid falling of urine in the pit. Cleaning of toilet with water was allowed comfortably as excreta hole cover made available and vertical gas out was also checked. Height of the excreta tank was reduced to two and half ft so that the children and aged persons could use it easily



L. Jelshyam Singh.

**RAINFALL IN THE PROJECT AREA RECORDED AT MATEOLOGICAL STATION,
WANGBAL (ABOUT 10 KMS FROM THE PROJECT AREA), THOUBAL DISTRICT, MANIPUR.**

Sl. No.	Month	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	TOTAL	NORMAL
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004		
1.	January	Nil	17.8	3.2	7.8	8.8	8.6	Nil	9.2	14.6	5.2	Nil	75.2	6.83
2.	February	42.2	43.5	53.8	148.6	27.0	18.0	17.4	37.1	58.4	35.7	63.0	544.3	49.51
3.	March	76.1	25.4	24.6	63.2	115.2	29.8	93.1	94.7	150.6	58.0	19.6	759.3	68.21
4.	April	230.2	36.6	28.8	77.0	27.4	30.8	34.4	32.9	69.4	231.2	54.6	851.3	77.57
5.	May	111.3	334.8	31.4	152.8	49.5	193.0	155.0	70.7	171.6	89.9	115.9	1475.9	134.17
6.	June	220.3	223.5	84.0	124.6	266.0	193.0	86.3	130.9	192.3	116.9	239.5	1876.6	170.66
7.	July	310.9	259.2	243.3	121.9	115.8	168.4	192.0	209.6	180.2	293.4	113.3	2208.2	200.72
8.	August	79.4	215.8	73.6	304.6	172.6	156.0	156.9	188.2	202.8	96.6	210.6	1862.1	168.82
9.	September	101.0	89.0	91.2	129.6	82.2	161.3	89.0	166.4	56.8	163.3	124.5	1255.1	114.03
10.	October	109.4	118.3	127.2	43.0	47.8	42.6	65.0	33.5	35.4	202.8	148.0	972.4	88.45
11.	November	67.7	46.8	11.8	15.6	12.4	122.0	15.0	7.4	43.0	Nil	51.2	383.9	35.718
12.	December	54.8	83.8	51.4	Nil	Nil	Nil	Nil	34.4	Nil	10.8	Nil	235.2	21.38
		1365.8	1491.5	824.3	1188.7	922.7	907.9	907.9	1015.0	1166.4	1365.8	1140.2	12499.5	1136.31

**MINIMUM AND MAXIMUM TEMPERATURE (CELCIOUS DEGREE)
RECORDED AT METEOROLOGICAL STATION, WANGBAL
(ABOUT 10 KMS, FROM THE PROJECT AREA)**

Sl. No	Month	Year 1997		Year 1998		Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1.	January	3.0	26.0	5.0	29.0	3.0	29.0	2.0	26.0	6.0	25.0	4.0	25.0	2.0	25.0	4.0	28.0
2.	February	6.0	27.5	5.0	29.0	5.0	28.0	3.0	27.0	7.0	24.0	5.0	27.0	2.0	25.0	5.0	25.0
3.	March	7.0	30.5	11.0	31.0	9.0	29.0	9.0	31.0	10.	29.0	13.0	31.0	9.0	30.	7.5	27.0
4.	April	8.0	32.0	9.0	33.0	8.0	31.0	14.0	32.0	14.0	34.0	14.0	32.0	13.0	31.0	12.0	29.0
5.	May	12.0	31.0	15.0	34.0	9.0	32.0	14.0	34.0	18.0	32.0	16.0	33.0	19.0	33.0	16.0	31.0
6.	June	21.0	31.5	18.0	34.0	12.0	31.0	16.0	31.0	22.0	33.0	18.0	33.0	20.	33.0	20.0	30.0
7.	July	21.3	32.0	20.0	31.5	21.0	32.0	22.0	31.0	22.0	31.0	19.0	32.0	23.0	33.0	22.0	31.0
8.	August	20.5	32.0	13.0	38.0	22.0	31.0	22.0	32.0	21.0	31.0	21.0	31.0	19.0	31.0	21.0	31.0
9.	September	20.0	32.0	19.0	33.0	18.0	32.0	18.0	32.0	20.0	31.0	20.	34.0	16.0	30.0	18.0	32.0
10.	October	14.0	31.0	15.0	32.0	15.0	31.0	13.0	30.0	14.0	31.0	13.0	32.0	14.0	31.0	14.0	32.0
11.	November	8.0	28.0	7.0	31.0	9.0	30.0	11.0	30.0	10.0	32.0	7.0	31.0	7.5	29.0	11.0	29.0
12.	December	5.0	24.0	4.0	29.0	5.0	26.0	4.0	24.0	8.0	25.0	4.0	28.0	4.0	25.0	3.0	24.0

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**HUMIDITY (%) IN THE PROJECT AREA
RECORDED AT MATEOLOGICAL STATION, WANGBAL
(ABOUT 10 KMS, FROM THE PROJECT AREA)
THOUBAL DISTRICT, MANIPUR**

Sl. No	Month	Year 1997		Year 1998		Year 1999		Year 2000		Year 2001		Year 2002		Year 2003		Year 2004	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1.	January	94	65	93	82	92	82	94	62	93	81	93	89	88	76	65	53
2.	February	93	82	87	83	93	85	97	66	93	89	93	85	92	54	64	42
3.	March	90	87	95	71	94	83	95	78	90	83	95	81	89	60	90	35
4.	April	95	81	95	83	95	79	95	81	90	80	94	91	91	72	91	45
5.	May	95	85	95	84	95	83	95	86	95	84	94	91	91	73	96	39
6.	June	95	87	98	88	95	87	96	86	95	81	94	91	91	58	96	61
7.	July	95	87	95	87	96	90	96	91	91	87	96	90	92	70	96	68
8.	August	95	87	95	83	95	92	95	91	95	86	92	57	96	64	96	58
9.	September	95	84	95	84	95	83	95	91	95	91	92	65	92	63	92	61
10.	October	94	83	96	91	95	91	95	70	96	90	91	61	95	58	91	56
11.	November	95	89	94	79	95	60	95	85	95	89	94	64	95	58	95	53
12.	December	94	84	95	83	94	85	90	83	94	89	92	62	95	60	94	53