

SACHETANA PLUS: FLUORIDE MITIGATION PROJECT

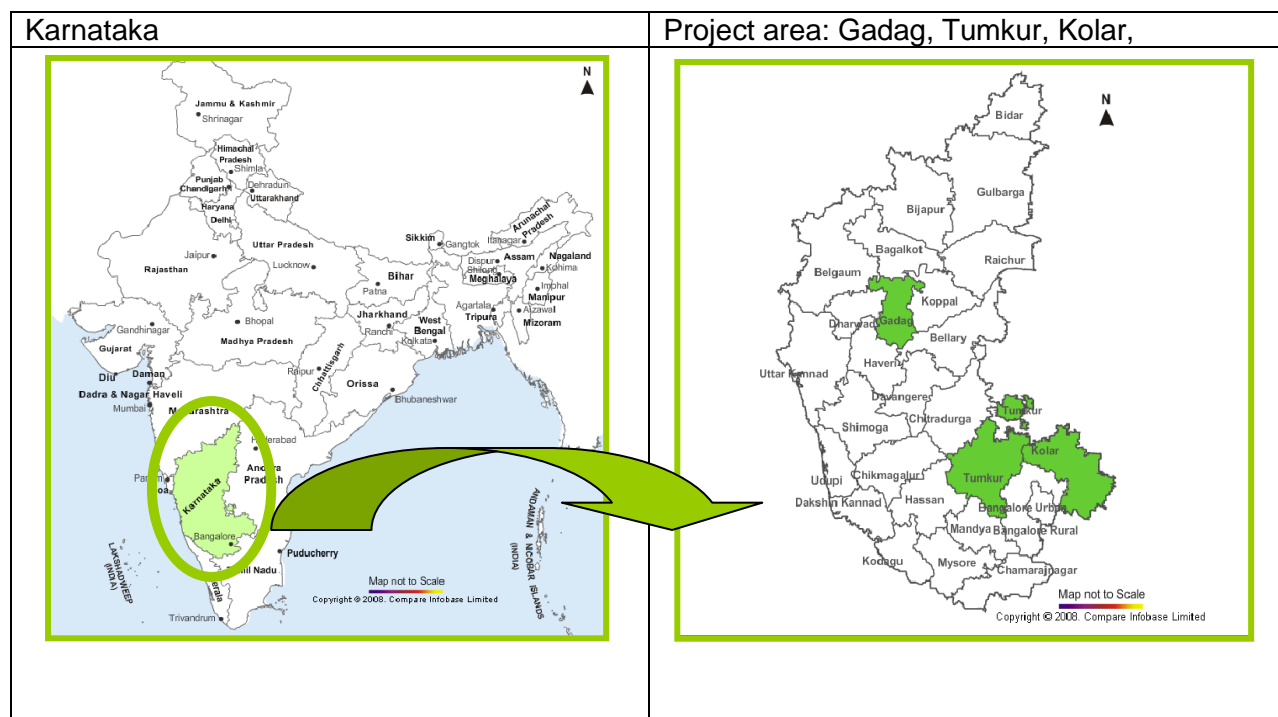
1. BACKGROUND:

BAIF Institute for Rural Development, Karnataka (BIRD-K), a nonprofit organisation based in Tumkur District started a programme on fluoride mitigation through rainwater harvesting in 1996. Though BIRD-K had worked on livelihoods and watershed development issues earlier, high fluoride content in the drinking water supplies in the district and its resultant health impacts didn't escape their notice. Hence, with a small grant from International Development Research Centre (IDRC), a Canadian Research institution, they started working on fluoride mitigation by trying and testing out a number of models with 15-20 families in Mundargi taluk, Gadag district. Bolstered by their success and the fact that this intervention could provide relief to a large number of people in the surrounded fluoride affected region, where the quantity of Fluoride was around 3 ppm and as high as 6 ppm in a few villages. The WHO standard prescribed a limit of 1 ppm in drinking water. BIRD-K scaled up its programme with support from German Agro Action (GAA) to nine villages in Gadag District. A number of innovations apart from rainwater harvesting were tried out. This included different models on roof top rainwater harvesting, groundwater recharge and massive afforestation programmes. The latter was based on evidence that latex yielding species could optimally absorb fluoride from sub surface flows. Though suitable latex yielding species could not be found, the afforestation drive still continued since it would at least absorb some levels of fluoride.

The success of BIRD-K's work had resulted in substantial interest in State Government circles. Mr. Kaushik Mukherjee, the then Secretary RD & PR Department took keen interest in the programme and visited the project sites. Convinced that roof top rainwater harvesting was a perfect solution to fluoride contamination of drinking water, he pushed for upscaling the pilot. However, this took its time. The Government has by then reposed complete faith in defluoridation units, which in reality were dismal failures on the ground. However, after a substantial gap since initial negotiations, an implementation framework for **Sachetana** was conceptualized. The funds for the same were sourced from Accelerated Rural Water Supply Programme (ARWSP). Sachetana envisaged working in 65 villages in 4 taluks in 3 fluoride affected districts.

2. PROJECT LOCATION:

Sixty-five fluoride affected villages in 4 *taluka* spread over 3 districts in Karnataka—Mundargi (Gadag district), Sira and Pavagada *taluka* (Tumkur district), and Bagepalli *taluka* (Kolar district). [See map: Project area]



The average annual rainfall in the area is in the range of 430-495 mm and the fluoride levels range from 1.0 mg/l to 5.34 mg/l. [See table: Features of the project area]

Table: Features of the project area

	Mundargi	Pavagada	Sira	Bagepalli	Total
No. of villages covered	14	17	14	20	65
Total No. of Households in these villages	3262	5176	2639	3938	15015
Avg. Annual Rainfall (mm)	482	495	452	430	465
Average Fluoride level mg/l	1.0 - 5.34	1.1 - 3.39	1.68 -3.5	1.7 - 2.4	

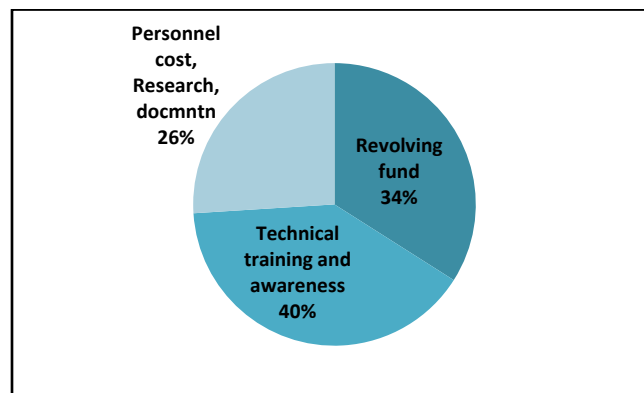
- *Beneficiaries* – The poor households in the selected 65 villages are the primary beneficiaries. The population of these 60 villages is about 60000.
- *Project duration:* June 2006-May 2010.

3. PROJECT PARTNERS:

1. **Rural Development and Panchayati Raj Department [RDPR], Government of Karnataka:** Provides funding support for hardware
2. **BAIF Institute for Rural Development (BIRD-K):** (a Non-Governmental Organization (NGO)) is the project implementation agency. The NGO has previously worked on a project on rural development and poverty alleviation (known as Sachetana funded by German Agro Action) in the same area since April, 2004. The Sachetana D/W project covers clusters of villages in three districts in the State. [website: www.birdk.org]
3. **Local community:** Overall contribution 23% of total costs. The expected community contribution ranged from 3-25% depending on the structure to be constructed and its ownership. For a direct recharging of aquifers through dilution wells the contribution was to the tune of 3% (of the total Rs 2.45 lakh) shared between beneficiaries. In the case of farm ponds costing Rs 6000, the expected contribution was 25%.
4. **Arghyam:** The Department of Rural Development & Panchayati Raj (RDPR) were to release funds for construction (read hardware), BIRD-K was supposed to provide technical support, ensure operations and maintenance (O&M) and community contribution. However, during negotiations with the State Government, there was increasing pressure on BIRD-K to reduce its awareness and capacity building costs (read software). BIRD-K was aware that downsizing software activities would comprise the impact and acceptance of the programme. At this point of time, Arghyam stepped in with support for such costs which were to be incurred by BIRD-K. Funding support for software costs [setting up revolving funds for facilitating community contribution, IEC and capacity building]

Revolving funds: As the community was finding it difficult to mobilize contributions, Arghyam supported BIRD-K, the NGO in-charge of programme implementation, to set up Rs 20 lakh revolving funds. This helped about 5,600 households in getting actively involved in the project.

[see graph: break up of Arghyam's investment]

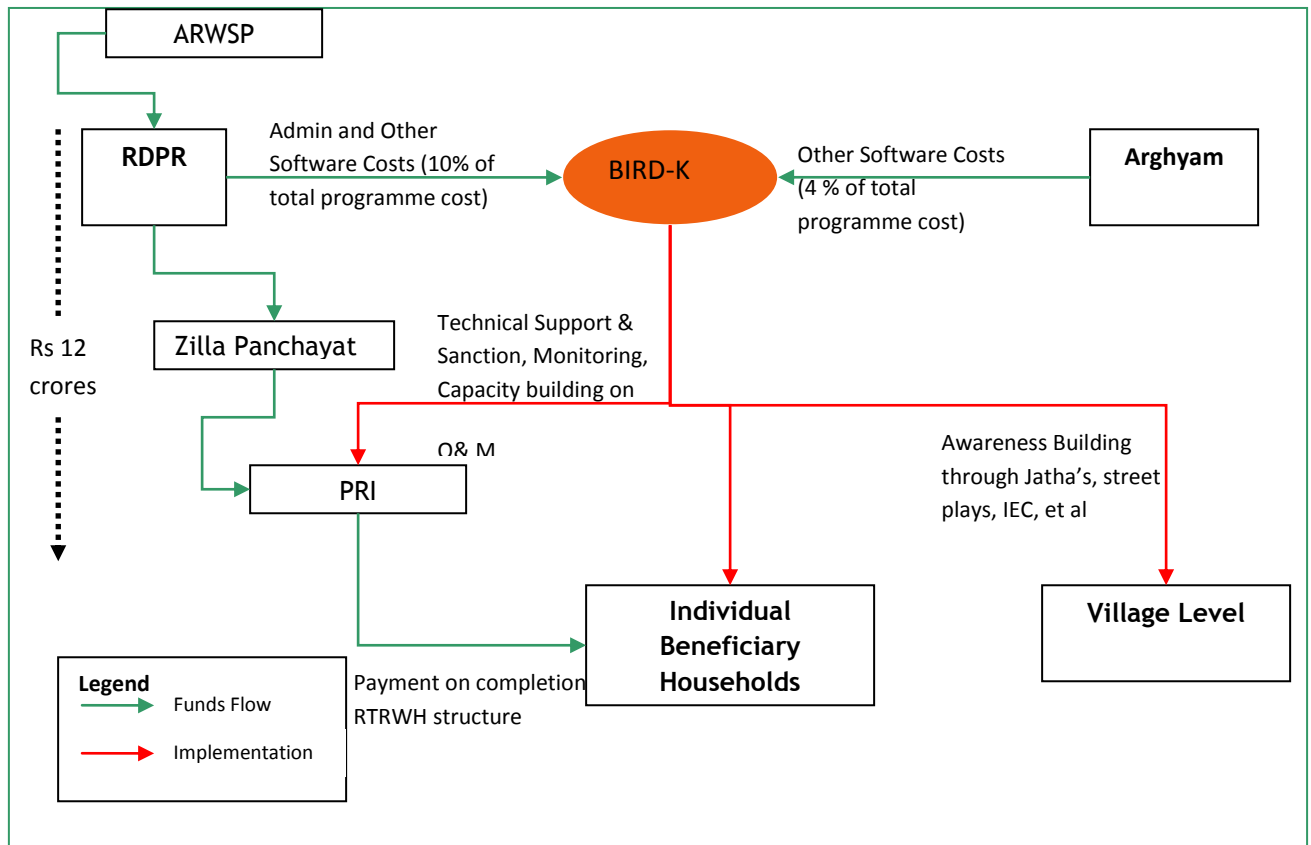


4. PROJECT COST

Total cost: Rs 15.40 crore (2006-2010);

- State Government: Rs 11.97 crore
- Beneficiary: Rs. 2.69 crore
- Arghyam support Rs 61.21 lakh [See figure: implementation and funds flow structure]

Figure: Implementation and Funds Flow Structure



5. PROJECT INTERVENTION:

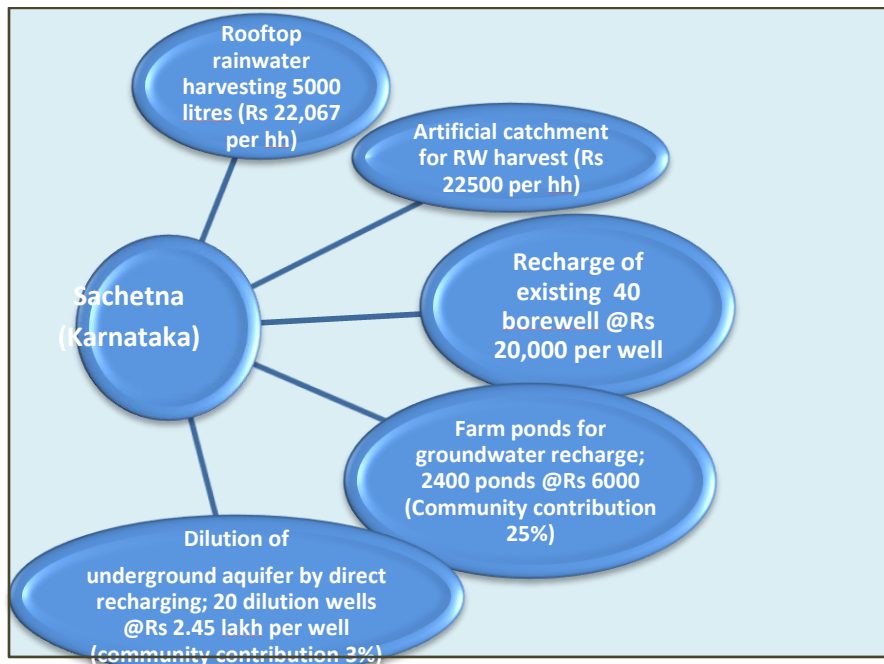
The focus of the intervention is to ensure household level drinking water security by improving the availability of low fluoride concentration water. The project also lays emphasis on increasing awareness as well as documenting the work being undertaken and its impacts.

Hardware: The model comprised providing rainwater for domestic consumption by construction of household rooftop water harvesting tanks and dilution of fluoride by direct recharge of groundwater.

1. Construction of Water Harvesting Structures for
 - Roof top rainwater harvesting (for domestic consumption)
 - Artificial rainwater harvesting (to increase recharge to dilute groundwater)
 - Recharge of borewells (to dilute groundwater)
 - Direct aquifer recharge (to dilute groundwater)
 - Farm ponds (to increase recharge to dilute groundwater)

The schematic of the model along with cost is shown in the chart below. It can be seen that the cost involved in rooftop water harvesting [RWH] structures is about Rs 22,000 per household. About 5,600 RWH structures will be constructed under the project. In the case of creation of artificial catchment along with harvesting tank also the cost was the same. The recharge structures for existing borewells cost Rs 20,000 per well.

Figure: Sachetna model for fluoride mitigation



In order to ensure that the water harvested is potable, periodic water quality testing is undertaken in a periodic manner. During the July-09 to Sept-09 quarter H₂S test [to assess bacteriological contamination] were conducted. About 94% of the samples were found potable. The samples which failed H₂S tests have been advised to undertake chlorination.

Sachetna plus in pictures



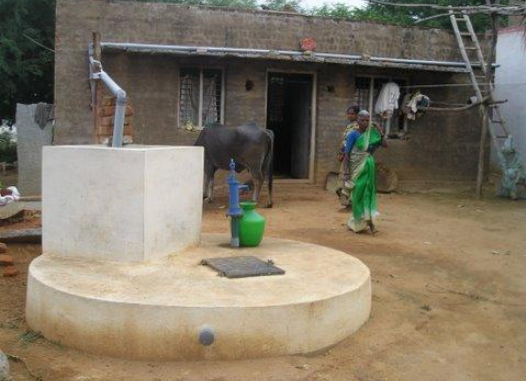





<p>Many evidences of dental fluorosis in the project area</p> 	<p>Lays emphasis on community capacity building</p> 
<p>A house being constructed with the rooftop RWH structure – building water harvesting into design</p>	<p>Safe water at doorsteps</p>
	
<p>RWH tank within the kitchen; plastic hand pump to draw harvested water</p>	<p>Artificial catchments created by coating lime</p>
	
<p>Direct recharge of groundwater for dilution of fluoride</p>	<p>Farm ponds</p>
	

Photo Courtesy: Arghyam, BIRD-K

Software: About 40% of Arghyam support was on training and capacity building. This included fluorosis awareness camps for school children; awareness camps and exposure visits for the SHG women; monitoring fluoride content in drinking water across seasons and study of impact of measures taken under SACHETANA project; clinical trials for treating the fluorosis patients with alternate systems of medicine including homeopathy; geo-hydrological studies for understanding the causes for fluorosis and to assist in effective recharge process for diluting the fluoride in underground aquifers. List of activities undertaken are given below:

Table: Software activities under Sachetna Plus

Name of the activity	Unit	Mund-argi	Sira	Pavagada	Bagepalli	Total.
Fluorosis awareness campaigns involving school children.	No of villages covered.	3	15	15	7	40
	No. of children participated.	172	1340	1758	1400	4670
Awareness camps in schools.	No of children participated.	1300	3400	115	721	5536
Awareness camps and exposure visit to SHG.	No of SHG	10	200	0	9	219
	No of participants.	170	406	0	87	663
Volunteers trained in alternate system of medicine.	No of persons	4	6	10	4	24
Training to SHG members on holistic health.	No of SHG; (No of members)	4; (35)	10; (180)	18; (227)	16; (370)	48; (812)
Monitoring of fluoride content periodically under Sachetana project	No samples tested since inception (periodically)	118	114	86	138	456

Note: As on September 2009