

Creative Lesson Plan on

Water



for teachers, educators and community workers

By ENRE (Ecology and Natural Resource Education) project
DRCSC (Development Research Communication & Services Centre)
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**'Creative lesson plan on WATER'
(Selections from 'Basbhumii' : booklet - 3)**

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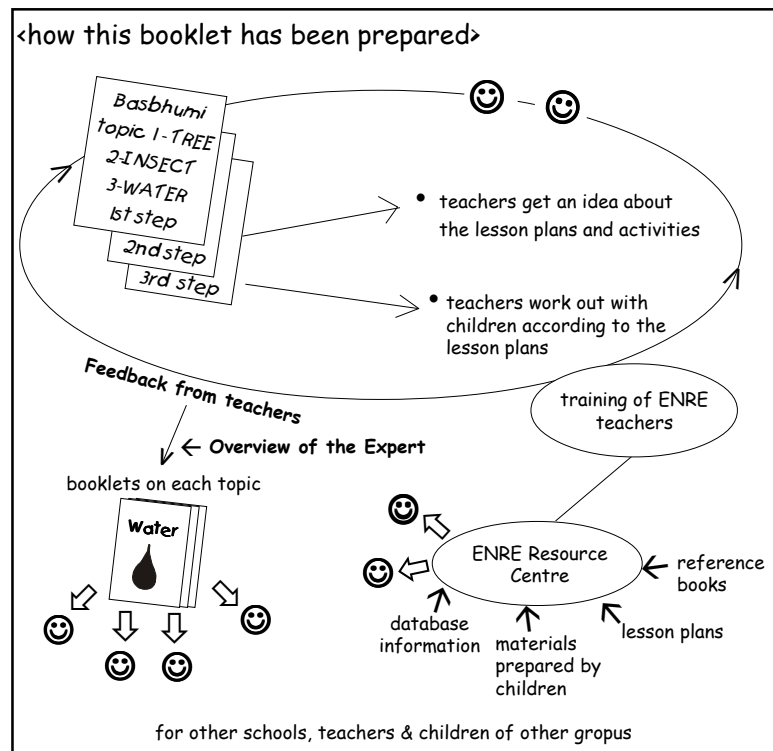


About this booklet —

All lesson plans included in this booklet were developed by ENRE team and tried out (and sometime modified) by teachers and children’s groups in ENRE network. Originally these lesson plans were provided to a network of teachers as model lesson plans targeted for class 4-9 children in shape of bi-monthly ENRE newsletter ‘Basbhumi (Living Places)’. Along with ENRE teachers’ training which guides teachers about concepts and skills of ‘active learning methods’, they have tried out each activity with their students in their class or as extra curricular activity for last 2-3 years. Their feedback makes this booklet more unique and life related.

12 topics related to Natural resources and their utilization / management etc. were discussed in various issues of ‘Basbhumi’ (in Bengali). ‘Insects’ is the second topic centred booklet in English & Bengali.

We hope this booklet is useful for other teachers and educators as well as community workers and even for those parents who are actively involved in environmental education or environmental activity in own local community. And we shall be delighted if this booklet can help in nurturing the mind & spirit of young generation who can take key role for caring about own environment and community life.



(Please see page 81 for forthcoming issues)

How to use this booklet —

The lesson plans in this booklet are designed step wise (see page 8 & 9). We suggest that you try out these activities step by step, but you can also adapt each core idea according to your local context.

Regarding teaching & learning process :

- You can get some ideas on how to prepare your own lesson plan promoting action learning.
- You can try out several participatory learning & sharing tools (eg, brainstorming, making charts & graphs, mapping, ranking, timeline, data collection, interview, presentation etc.) for your class.
- You can get ideas on how to connect your class room to your community.
- You can use these lesson plans both for school curriculum and extra curriculum work and obviously you can generate children's interest & enthusiasm on Environmental issues and activities.

For community aspects :

- You can help children to collect local data on natural resources in their neighbourhood and encourage them to know more about their surroundings.
- You can organize children's group to improve local environment through collective action.
- You can grow community members 'awareness on environment through children's' activity.

For home :

- You can try out some of these activities with children in your home during their school holidays. We are sure you can design your own home –based activity for a greener world, because we have already got good feedback about this from various people.

In 'reference' section we have included **expert's view point on the topic** and also have introduced some useful documents. You can get some ideas how your community based activity can be related and contribute to global environmental issues etc. and hopefully you can utilize these resources & information to strengthen your capacity of facilitating activities.

About lesson plan —

Through activity of ENRE project we have realized that creating & developing own lesson plan is extremely difficult for most of the teachers participating in the network. Primarily because they don't have the habit and experience to do so. The situation must be more or less same for other teachers in our country. Though Environmental Education as a subject has been brought into the school curriculum, the teaching method is text book centered, memorizing & repetition based and examination oriented just like the other subjects. But can children develop their interest about any issue by memorizing names of trees, birds, and animals etc. or just by copying the text book's drawing of seed germination or insects' metamorphosis etc. ? Unfortunately for children (fortunately for teachers?) all answers are already given and always appear on the text books. We wish the learning process could be more exciting and open ended process rather than 'being hammered by more and more information'.

What is 'creative lesson plan' ?

We think that good lesson plans provide children with the opportunity of discovering and searching out the fact by themselves. Children can chose their favorite learning process and context and the teachers only need to facilitate it, rather than impose uniform style & pace.

Creative lesson plans have the following aspects.

- Starting from what children already know and what children have experienced / felt;
This helps to enhance children's interest about the topic.

- Having the overall goal for both 'Social / Environmental' and 'Scientific'.
For example on the topic Water, social / environmental goal can be <learn about how to prevent water borne diseases> <create action for saving water source in own locality>, and scientific goal can be <observe & make a profile of aquatic plants & animals around the community pond>

<learn about several methods of water purification> etc. Setting up goals help the children to be aware that they can do something to improve their environment and solve some of the problems.

- Including group activity as well as individual activity. Through group discussion, planning, and activity children can find out better ideas and solution and also can grow their cooperative attitude

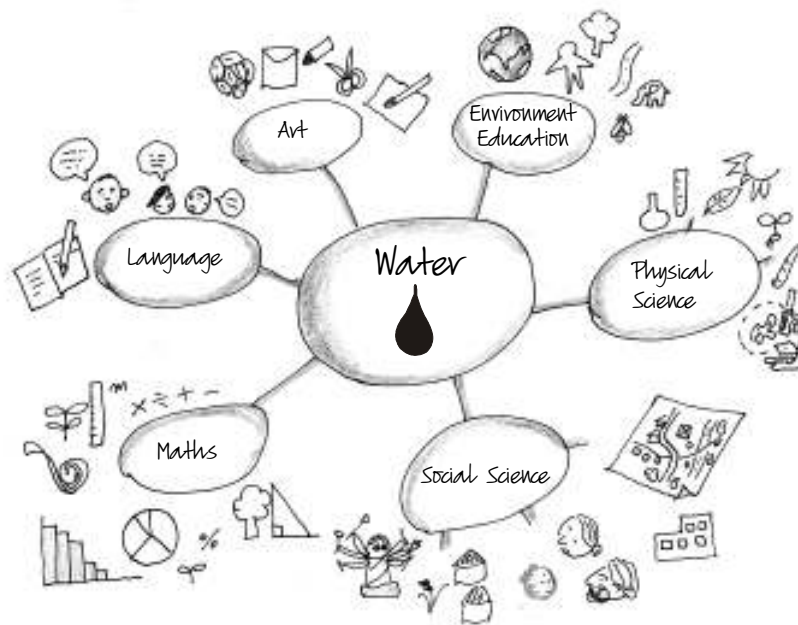


and collaborative skills. They can learn to respect other's opinion, too.

- Children can have fun and relish the moments of discovery in their learning process.
- Children's learning activity links their class room and community. This is essential for Environmental Education as we need more initiatives for a better environment.
- Using active & group based learning methods with children (eg, brainstorming, making charts & graphs, mapping, ranking, timeline, data collection, interview, presentation & sharing skill etc.)
- Using local materials and examples for activities. You can make the activity more low cost and eco-friendly by using waste material.

Curriculum connection

Creative lesson plan has an integrated curriculum approach. This helps you to weave what you are doing in science or EVS (environmental studies) with math, language, social studies, geography and art etc. We illustrate below how each activity in this booklet can be connected to school curriculum.



Water

■ Overall goal

Water situation (its availability, quality & quantity etc) is different in place to place even within the same state & same district. Some survey shows generally in India, 90% of fresh water resources are used for Agriculture and 6% for domestic use. According to results of nationwide surveys 14% of rural households do not have access to improved drinking water supply and 86% of rural households lack basic sanitation facilities (Year 2000, UNDP).







In ENRE activity, children learnt about own water situation and they are encouraged to use & recycle water wisely in both domestic & community level. This contributes for better sanitation and also creates children's involvement for better water resource management in locality. Children find out they can do a lot of things for improving the water situation.

■ Activity Steps



Step 1 Preparatory work


to raise children's interest and to know what children already know. Children keep their records more scientifically.


- | | |
|--|--|
|  Activity (A)
'Water and Our Life :
from Where & How Much' |  Activity (B)
'Water Source
Mapping' |
|  data collection, graphing
(pie graph) |  mapping, drawing,
group work |
|  Measurement volume
(Maths) |  Social Study,
Map scale (Maths) |

Step 2 Further enquiry

to collect more information/data. Children make interview to local community

Activity (A) **'Let's make a Water Filter'**

 data collection, conducting an experiment

 Safe drinking water (EVS),
Water borne disease (Health)
Water Purification (Science)

■ Changes Expected

- More children's eco-groups are created and children become actively involved in better water resource management in their own neighbourhoods.
- Appearance of small gardens of vegetables, herbs & fruit trees by using waste water around taps & wells in community.



conduct some experiments & members.

Step 3 Investigation/Project Work

to create child-oriented activity. Children can apply their collected information into designing studies meaningful for community.

Activity (A) 'Pond Management'

👉 mapping, data collection & analysis, measurement, social work

📖 water resource management (EVS & Social studies)

Activity (B) 'Water Source Improvement'

👉 observation, group work, social work, drawing

📖 water & hygiene (EVS), local government role for water sources (Social studies)

Activity (B) 'Our Water & Hygiene Behaviour'

👉 listing, processing information, interview

📖 Water & sanitation (EVS), Water borne diseases (Health), Language

Concepts and techniques which you can develop in activities

Keywords	Step 1		Step 2		Step 3	
	(A)	(B)	(A)	(B)	(A)	(B)
Domestic use of water (water consumption)	✓	✓	✓	✓	✓	✓
Water borne diseases / sanitation			✓	✓	✓	✓
Different water sources	✓	✓	✓	✓	✓	✓
Water resource mapping		✓			✓	✓
Recycling & saving water					✓	✓
Community based water management					✓	✓

We got feedback from different Organisations —

Even if we all do the same activity, our results could be different, depending on where one lives or the children's abilities. It's quite natural for this to happen. The results that you obtained and data collected which is specific to your locality will become a valuable case study. In this booklet, we will share with you the feedback we got from different ENRE network groups. You can compare your results with theirs.

We would like to learn more about the urban school situation & about hill areas from the other groups, since we do not work in these areas yet. So, it would be nice if you would share your experiences.

Gandhi Vichar Parishad group

Bankura district

4 teachers were involved in conducting various activities. This district is located in a dry-land area. The Vegetation & soil there is rather different from that of other groups. Fortunately, a beautiful river runs through their villages and provides an important water source including for drinking water.

Kajla group

Midnapore district

5 teachers & their students conducted the activities within their E.E. school curriculum in 6 villages. About half the children belong to Hindu families and

the rest are Muslim.

The area is located in the coastal area and regularly hit by cyclones. As a result it does not have irrigation facilities.

Agriculture, Small scale industries (handicraft) and fisheries are the main sources of livelihood in this area.

Chandannagore group

Hooghly district

One of the staff from ENRE team tried out these activities with her children as home-based activity. Children study in English medium schools unlike the other children in network. Chandannagore is a small town and located on the bank of Ganga river. Many trees and ponds are observable like in other towns in this district. Many commuters go to Calcutta everyday by train from here.

West Bengal

India

Swanirvar group

North 24 Pargana district

4 network teachers in association with 13 other teachers conducted activities with children in 8 villages. All the children study in government schools & are aged between 10 & 16 years.

Intensive agriculture is the main occupation of this area and the farmers used to apply large amounts of chemical fertiliser & pesticide.

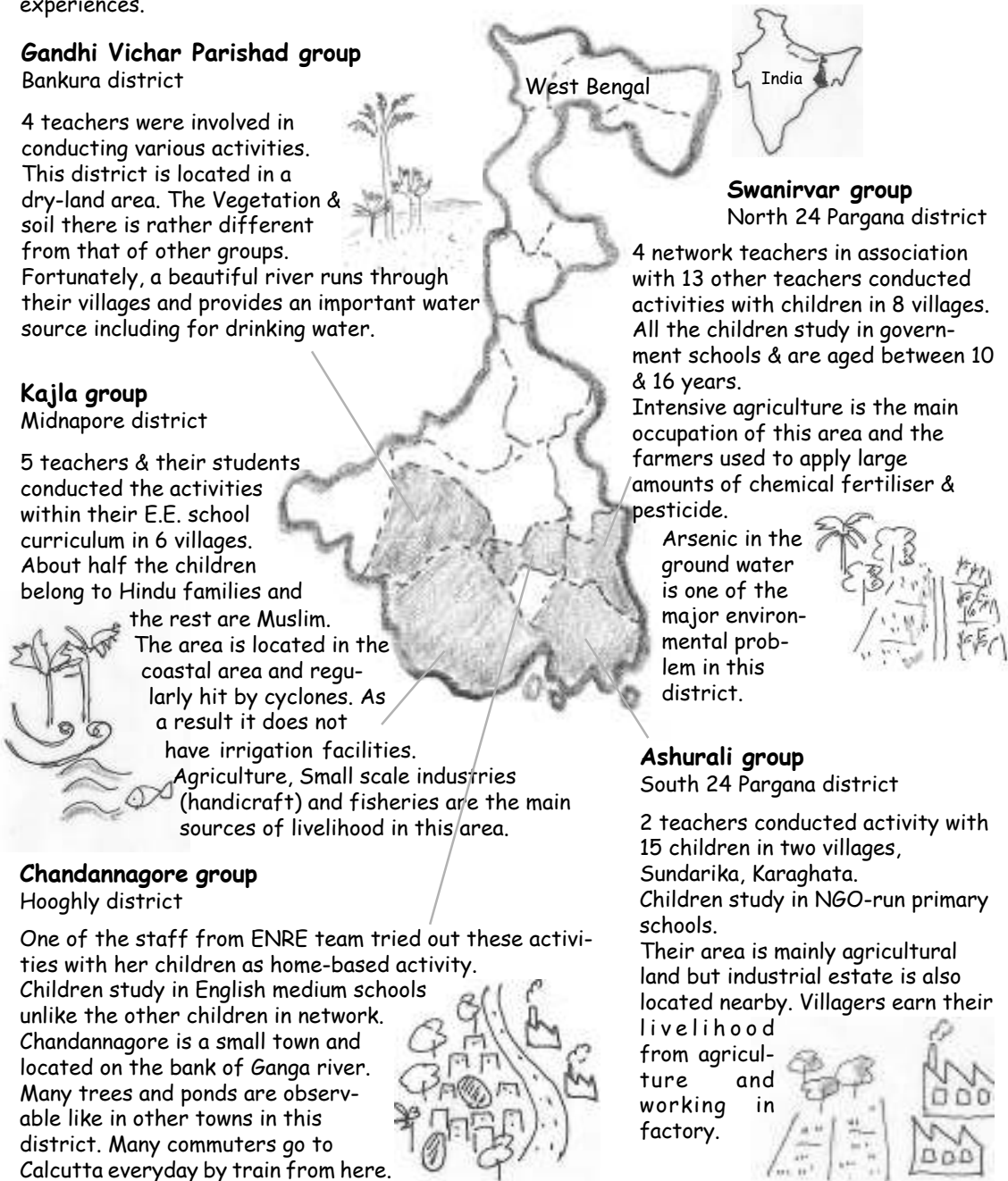
Arsenic in the ground water is one of the major environmental problem in this district.

Ashurali group

South 24 Pargana district

2 teachers conducted activity with 15 children in two villages, Sundarika, Karaghata. Children study in NGO-run primary schools.

Their area is mainly agricultural land but industrial estate is also located nearby. Villagers earn their livelihood from agriculture and working in factory.



Step - 1



for growing children's interest

 **Lesson Plans**

 **Feedbacks**



WATER — Step 1— Activity (A)

"Water and Our Life : from Where and How Much ?"

Check on how you and your family are using water.

[📅 for both rural & urban schools 😊 class 5 to 7 ✎ data collection, graphing - pie graph
📖 measurement, volume, % (Maths)]



Objectives

- To discover and realise the importance of water in our daily lives.
- To see in what ways a number of different factors are related to domestic water use.
- To understand the “water situation” in our area by studying individual conditions and putting them together.



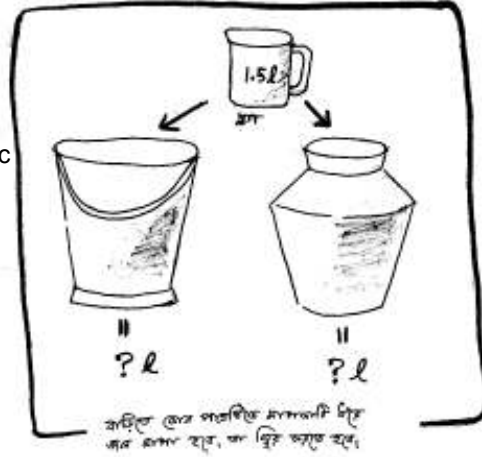
Questions to Investigate

- Sources of water for domestic use in your area.
- Are there any problems related to domestic water use?
(quality, accessibility, quantity etc)



Activity : Water use chart

- Ask the children from where the water is brought to their households and for what purposes they are used. (eg. Drinking water from well, bathing water from pond etc)
- Discuss with the children how the amount of water used for each domestic activity can be measured. Set a standard for measurement (for eg. One bucket = 10 litres etc)
- Ask children to make a “water use chart” for each household.



Example of a “water use chart”:

Purpose	Source	Location of source	Quantity used					Water quality	other things that we use
			myself	mother	father	sister	grand father		
washing teeth									toothpaste, neemstick, soap, oil
bathing									
washing clothes									
cooking									
gardening									
toilet									
cleaning the house									
washing dishes									ash, soap
Drinking									
		total							
								total water/day/ family	

Besides finding out the source of water and the quantity, there are other aspects that could be researched for better understanding the water situation, like

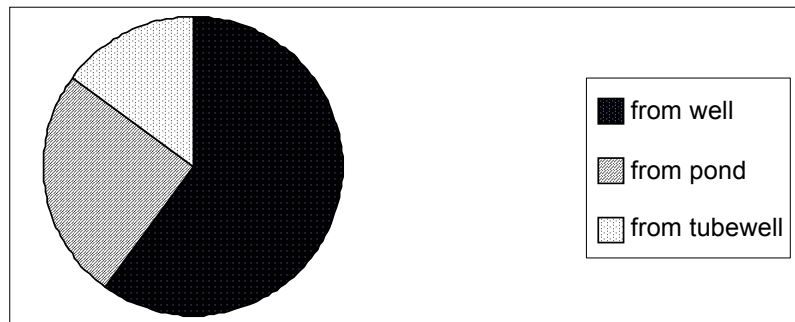
- Who collects the water, from where and how?
- How many pots/buckets does he/she collect per day?
- How far away is the water source? Is it same round the year?



Analysing the Information

- First hold group discussions and have the children summarise the information.
- Next prepare a class summary.
- Calculate the average quantity of water needed for domestic use per person per day.
- Can the situation of the water sources in your area/village be understood through the data collected by the children on each household?
- Calculate the percentage of each source. Collate the data (separately for each domestic activity where we use water) into a bar-diagram, pie chart or graph.

Example: Water used for drinking and cooking (Pie chart)



(the same can be done for bathing, washing clothes, washing dishes etc.)



- Make a list of the difficulties faced in collecting/using water

Further Activity

- Have the children to think about the state of water and health based upon the results obtained
- What else is water important for; beside domestic consumption/use?
- Encourage the children to check out the environmental state of the main water sources (1-B).

Giving Reference Information

Present these information & discuss with children.

Use of Water



- To sustain a reasonable quality of life requires about 80 litres of water is required per person per day. But average consumption ranges from 5.4 litres per day in Madagascar to 500 litres per day in the U.S. (India : 25 litres / person / day)
- In world water use, irrigation accounts for 73%, industry for 22% and 5% is for domestic use.
- Upto 90% of the water used domestically and by industry may be returned to rivers and re-used, but some 75% of the water supplied for irrigation is lost.

[source : GAIA Atlas of Plant Management 1984, Pg. 109]

Irrigation needs lot of Water

The main demand for water is for irrigation. In 1974, irrigation used about 92% of all the water consumed in India.

Domestic and Industrial uses accounted for the remaining 8%. Water scarcity in rural areas or the lack of access to it, forces people to consume less.

[source : The State of India's Environment, 1984-85, 2nd edition, p.29]



Feedback

Step 1 — Activity (A)



In this activity children are encouraged to measure domestic water consumption in their families by keeping record of 'Water Use Chart'.

In this process children can realize the various water sources & they need to think how they can measure it for visualizing the water consumption. Sometimes it might be difficult to measure how much water is used during taking bath, washing clothes in pond. We want to see how children can solve these problems into making their record with the help from teachers.

Another point we want to see through childrens' survey is that the local water use situation in comparison with Indian Statistical Data on this issue.



Summary of Feedback from Teachers

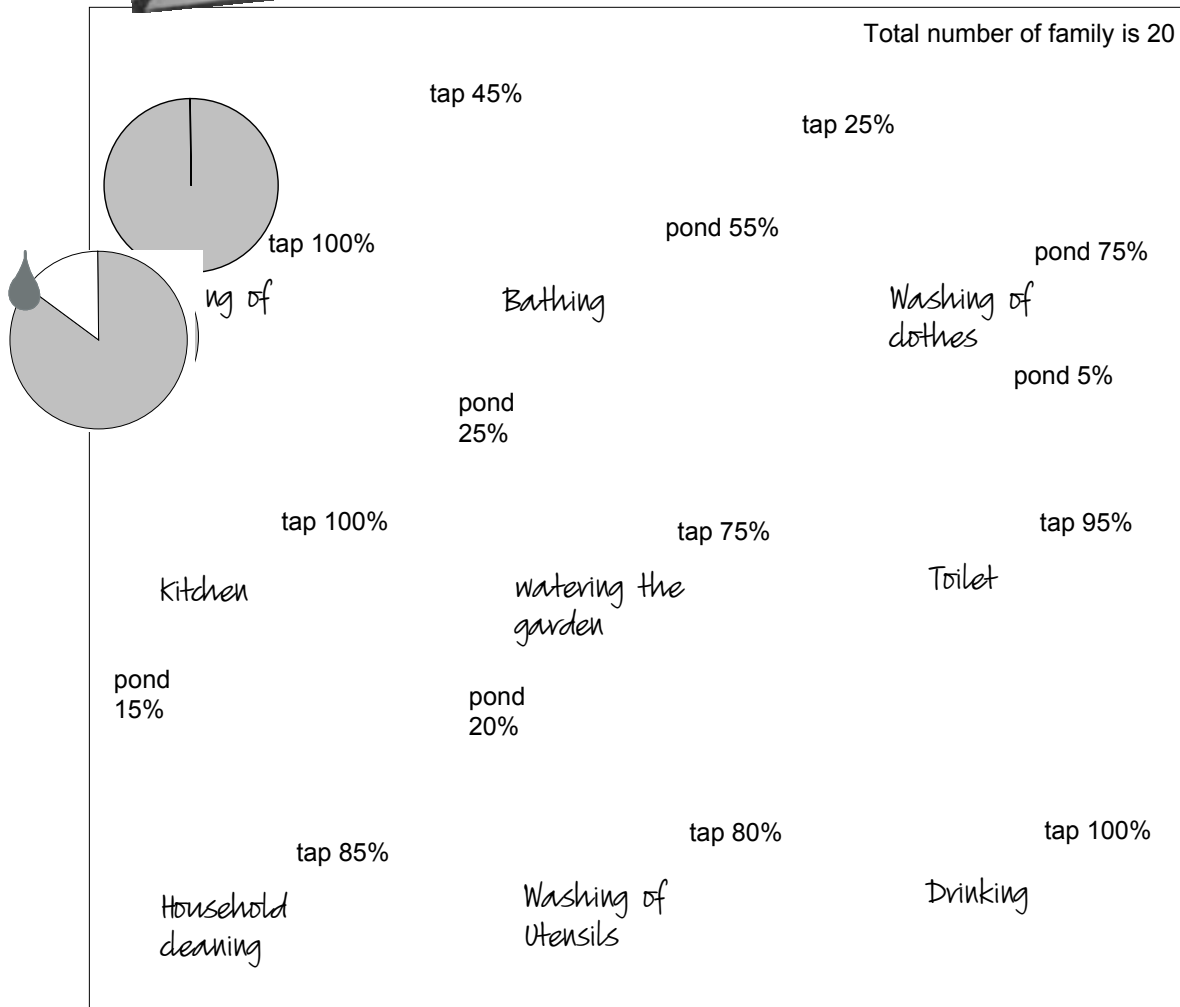
	Swanirbhar	Kajla	Gandhi Vichar Parishad
1) Village	Fatullapur	Hinchi	Not mentioned
2)Childrens' class / number	class V to X	class VI to XI 20 students	No report from teachers have been received.
3)Class / Period	3 periods 1 period = 2 hrs	5 periods 1 period = 1 hr 30 minutes	Only 4 charts on 'utilisation of water' by children have been received.
4)Results (Source of water, uses of water, problems of water usage)	The activities have been done by children. Summary of the charts have been mentioned.	The activities have been done by children. Summary of the charts have been mentioned.	
5)Interest of Children	Children have interest in doing their work. But they do not have enough time.	Not mentioned	
6)Teachers' opinion/ difficulties	Some problems were faced. Many questions came from many students and family members. The reasons for doing this activity were explained to childrens' parents.	At first some problems were faced. Through these activities, the students came to know about uses of water, and how water gets contaminated.	

Summary Chart

■ Swanirvar



Class V to IX (11 children, 2 groups) of Swanirvar collected information from 20 families. They drew pie charts of water sources for each water using purpose.



■ Gandhi Vichar Parishad

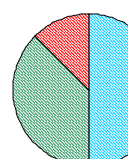
From GVP group, 17 children of class V to VII prepared the summary chart on water sources & uses.

The percentage of the sample number (from how many households the information have been collected) on the basis of water use is not clear. Also the pie charts are not proper.

The information of the chart is typed below.



No.	Source	Observation	Utilisation	
1	River	Fed by rainwater, non perennial, water is there for 5 months during monsoon, remains dry at other times of the year.	Used mostly for drinking. Used for bathing & irrigation. People dig holes on river bed and collect rainwater in dry seasons.	
12	Ponds	Water is there for 3 months. For the rest 3 months the water is not fit to drink. Drains are there in the surrounding areas of the pond. Waste products do not enter the pond.	Most of the families bathe, wash clothes and utensils and use for irrigation. The water is also used for Paniphal cultivation.	
7	Tubewell	Used throughout the year. Particularly in summer this water is used for drinking and cooking purpose. The water is also used for bathing.	People store water after preceptating & decanting it. Used for bathing.	
25	Tap	Supply takes place from 7am to 9am and 4 pm to 6 pm everyday.	Most of the families depend on this water. Used for drinking. Also have other uses.	
50	Wells	Present in most of the houses.	In absence of tap-water people use well water for drinking. Used for bathing, washing clothes. The waste water is used for growing banana and arum.	



From Childrens' Work

Data collection of family members' water consumption. We have showed here 4 childrens' chart. (retyped on computer)

a) Robin Mondol (class --)
Teacher - Tannu Mondol, Swaminvar

	Activity	Source	where situated	myself	aunty	uncle	uncle	grand father	grand mother	broth-er	total	things we use
1)	Brushing	tap	beside the house	1 litre	1 litre	1 litre	1 litre	1 litre	1 litre	0.5 litre	6.5 litre	brush, colgate
2)	Bathing pond	tap	'	5 buckets	10 buckets	10 buckets	6 buckets	5 buckets	10 buckets	5 buckets	51 buckets	bucket, towel
3)	Washing clothes	pond, tap	'	1/2 bucket	1 bucket	1 bucket	2 buckets	x	2 buckets	x	6.5 buckets	soap, bucket
4)	Garden	tap	'	5 buckets	x	x	5 buckets	x	x	3 buckets	13 buckets	bucket
5)	Toilet	tap	'	1 bucket	2 buckets	2 buckets	2 buckets	2 buckets	2 buckets	1 bucket	12 buckets	bucket, mug
6)	Washing rooms	tap	'	x	2 buckets	x	x	x	1 bucket	x	3 buckets	bucket
7)	Washing dishes	tap	'	x	5 buckets	x	x	x	5 buckets	x	10 buckets	bucket
8)	Drinking	tap	village/ Rudrapur	3 litre	3 litre	3 litre	3 litre	2 litre	2 litre	2.5 litre	18.5 litre	glass, jug
9)	Other use	tap/ pond	'	1 bucket	2 buckets	2 buckets	2 buckets	2 buckets	3 buckets	1 bucket	13 buckets	mug, bucket
10)	Cooking	tap/ pond	beside the house	x	5 buckets	x	x	x	5 buckets	x	10 buckets	dish, vegetables, rice,

1 bucket = 10 litre water

b) Kavtick Mondol, class VII
Teacher - Tanna Mondol, Swaminagar

	Activity	Source	where situated	myself	aunt	uncle	sister	elder sister	grand-father	grand-mother	total	quality	things we use
1)	Brushing	tap	beside the house	2 litre	2 litre	2 litre	1 litre	1litre	2 litre	2 litre	12 litre	iron & arsenic	toothpaste
2)	Bathing	tap, pond	"	10 buckets	pond	pond	4 buckets	pond	2 buckets	pond		"	bucket
3)	Washing clothes	tap, pond	"	4 buckets	4 buckets	4 buckets	2 buckets	3 buckets	2 buckets	4 buckets	23 buckets	"	surf & soda
4)	Cooking	tap	"	2 glass	2 glass	2 glass	1 glass	2 glass	2 glass	2 glass	13 glass	"	spices
5)	for Garden	tap	"	1 bucket	x	x	x	x	x	x	16 bucket	"	bucket
6)	for Toilet	tap, pond	"	2 jug	2 jug	2 jug	2 jug	2 jug	2 jug	2 jug	14 jug	"	
7)	Washing room	tap, pond	"	x	1 bucket	x	x	x	x	x	1 bucket	arsenic	bucket
8)	Drinking	tap	"	2 jug	2 jug	1 jug	1 jug	2 jug	2 jug	2 jug	12 jug	"	bucket
9)	Washing dishes	tap	"	x	3 buckets	x	x	x	x	x	3 buckets	"	bucket & surf

Total 28 buckets, 26 jugs, 57 buckets

c) Amal Roy, -- class, teacher - Sitangshu Roy, Gandhi Vidhar Parishad

	Activity	Source	Where situated	mother	father	myself	brother	sister	total	quality	things we use
1)	Brushing	tube-well	approx. 200 ft.	1 litre	2 litre	1.5 litre	2 litre	2.5 litre	9 litre	medium	brush, red tooth paste, colgate
2)	Bathing	pond	approx. 500 ft.	3 buc.	4 buc.	2 buc.	3 buc.	2.5 buc.	14.5 buc.	medium	soap, oil, towel
3)	Washing clothes	pond		3 buc.	2 buc.	4 buc.	3 buc.	2 buc.	14 buc.	medium	soap, detergent, soda
4)	Cooking	well	approx. 400 ft.	7 buc.						good	
5)	for Garden	small pond	near the house	4 buc.	6 buc.	10 buc.	8 buc.	8 buc.	36 buc.	medium	bucket, mug,
6)	Washing room	small pond		4 litre	2 litre	1 litre	1.5 litre	5 litre	13.5 litre	medium	broom, bucket, cloth, pot
7)	Washing dishes	small pond / tube-well		15 litre	4 litre	3 litre	2 litre	3 litre	27 litre	medium	rim, soap, detergent, water, mug, glass, pot, bucket

d) Bijoy Roy, -- class, teacher - Sitangshu Roy, Gandhi Vidhar Parishad

	Activity	Source	Where situated	myself	mother	father	brother	brother	sister	total	quality	things we use
1)	Brushing	pond, well, tubewell	beside the village	2 litre	2.5 litre	3 litre	2 litre	2 litre	2 litre	13.50 litre	medium	brush, colgate, paste etc
2)	Bathing	pond well	'	15 litre	20 litre	20 litre	15 litre	16 litre	17 litre	130 litre	'	rope, bucket, mug, soap, oil
3)	Washing clothes	pond, well, tubewell	in the village	20 litre	25 litre	30 litre	22 litre	21 litre	23 litre	141 litre	'	soap, bucket, rope, brush etc
4)	Cooking	well	beside the village	x	20 litre	x	x	x	23 litre	43 litre	good	cooking utensils
5)	for Garden	pond	'	30 litre	30 litre	32 litre	x	x	22 litre	114 litre		bucket, pot
6)	Washing rooms	well	'	1 litre	1.5 litre	2 litre	1 litre	15 litre	1 litre	21.5 litre		broom, pot, bucket
7)	Washing dishes	pond	'	2 litre	10 litre	3 litre	2 litre	2 litre	15 litre	34 litre		rim, soap, water

- Teacher Tarun Mondol (Swanirvar) worked with children in Question & Answer style related to Water. We mention here the question & answers from childrens' notebook of Kartik (class --) & Robi (class--). Their handwriting is very clear; but we typed them for convenience.

Questions	Kartic Mondol	Robin Mondol
1. From where do we get water ?	From tap, ponds we get water	Water resources are looked from different angles. People get water from tubewell or draw under-ground water from open well by rope and pully.
2. How much water does the family require ?	We are 7 in number and require 224 litres of water daily	We require 30 litres everyday
3. How different activities are related to the use of water in households ?	In household water is required for cooking rice, vegetables, washing of utensils, making pastes of spices etc. Alongwith this water is used for bathing, cleaning, drinking etc	Water is required for washing hands and faces in the morning. Cooking requires a lot of water. Bathing keeps one healthy and this requires water. Without water organisms cannot live. So the other name of water is life. Clearing bowls and urination keeps human healthy and this also requires water.
4. The state of usage of water in terms of quality and quantity	A few metres away from my house there is a tap. But the water looks dirty and contain iron	All the taps, set up in our area contain iron. Beside this, tests found out that it also contained arsenic, which is causing disease outbreak. The water has to be boiled to decontaminate it. In terms of quantity we are not facing any problem.
5. What are sources of usable water in your area ?	Pond & tap water	The sources of usable water in our locality are tubewells, ponds, rivers and rainwater
6. Do you face any problem with water ?	Yes, the iron content of the water is high and so there is an outbreak of disease	The quality of water is not upto the mark, but there is no such problem in terms of collecting it.
7. From where water is brought to the home & how it is used ?	Not mentioned	Water is brought from tubewells, wells and ponds. This water is used for various

		purposes mainly washing, cooking, bathing, toilet, washing of utensils and clothes, drinking etc.
8. How do you measure the quantity of water used for different purposes ?	Litre	By using a small mug, one can measure the amount of water used for different purposes. Tub can be used to measure large volumes of water
9. By what means and from where water is brought everyday ?	I fetch water in buckets from tap on foot	Everyday lads of the family fetch water in large containers from Rudrapur by cycle. Beside this mug or pitcher is used to fetch water from the tap near the house. The elders bring water in pitcher and tin tubs/buckets.
10. How far is the source of water and how long does it require to fetch water ?	The place is within 5 minutes walk from my place	Drinking water is fetched from a place which just few more than 1 km, from the house. It takes half an hour to fetch water for other uses. Water for other uses is fetched from a place, 2-4 minutes away.
11. Does the same amount of water being collected from the same source ?	Yes, water has to be collected from the same source throughout the year	No, water is not collected from the same source round the year. Same amount of water is not collected throughout the year.
12. Explain how important is water in our life	Water is very important in our life in every aspect like washing, bathing, cleaning, cooking, drinking etc	The other name of water is life. We use water in our households. In the morning, we need water to wash ourselves, prior to making any food. We spend water for cooking, bathing. Beside this we use water for toilet. Water is also used in agriculture in large amount.
13. What benefits & problems can be seen in doing these activities ?	We are benefitted in doing the work. We have gathered many knowledge. We became aware of many things in doing these works.	We learnt many new things in doing these works. Though we have lived in countryside for long, we did not think about many of these aspects We learnt many things on this. We have learnt to draw maps of our locality.
14. How much time you have required to do this work ?	We required 5 hours.	We required 3-4 hours.

⇒ How teachers can improve the work

- listing of questions by the children through discussion with the teacher
- check students' answer represent their own household situation related with water
- If students' answers state mostly 'general' situation, think again the way of set up questions' are proper or not (refer 'Sharing Ideas' step 2 - activity B)
- Think again the basic concept of our active learning method. The process of enquiry is more important than a quick answer. Encourage children to state more how they reach their answer.



Reflections

Water availability & sanitation is considered one of the indicators to show the human development and life standard.

As we mentioned in the lesson plan (step 1-A & step 2-A) some data from 'GAIA : An Atlas of Plant Management, 1984', it says 80 litre of water per person per day is required to lead a reasonable quality of life. Then they show some examples of average consumption per person; India 25 litre/day, Nigeria in Africa 20 litre/day and USA 500 litre/day. We are surprised to see huge amount of water consumption in USA but also when we see the data of 5.4 litre / day / person of the Madagascar, simply we must wonder how people there can manage with so little water.

[According to the data of water supply in metrocities (1994-95) Calcutta Municipal water supply covers 90% of the population in Calcutta and supplies 200 litre / person / day [source : "CSE, States of India's Environment - The Citizen's 5th Report/Part II : Statistical Database"]

How about our local situation ? Please see again 4 water record charts prepared by children. If we simply calculate (total water consumption ÷ family members), Kartic's family use 32 litre/ person/day ($224 \div 7$), Robin's family use 86 litre/person/day ($602 \div 7$), Bijoy's family use 87.5 litre ($525 \div 6$) and Amal's data is not complete.

Torun Mondol (teacher, Swanirvar) summarized in his report the average use was 48 litre / day / person according to childrens' data.

It must be interesting to discuss with children based on their summary result & other common statistics.

How do the children feel & think about their water consumption situation ? Do they feel that they need more water ? If so, for what ? OR are the children satisfied with their water situation ? Like this, teachers can pick up childrens' voice as much as possible. Teachers should be happy if some children say "500 litre / person / day like USA is just wasting their natural resources. They should learn more about our way of using water !"

We welcome childrens' opinion !



WATER — Step 1— Activity (B)

"Water Source Mapping"

In the village we get water for domestic use from several different sources unlike in the towns, where almost all the water is obtained from a tap inside the house. Let's investigate this phenomenon.

[🏠 for both rural & urban schools 😊 class 5 to 7 🗺️ mapping, drawing, group work, 📖 social study, map scale (Maths)]



Objectives

- To know about the different sources of water we use.
- To find out if there are any difficulties in accessing water in our area.
- To check out the environmental condition of our water sources.



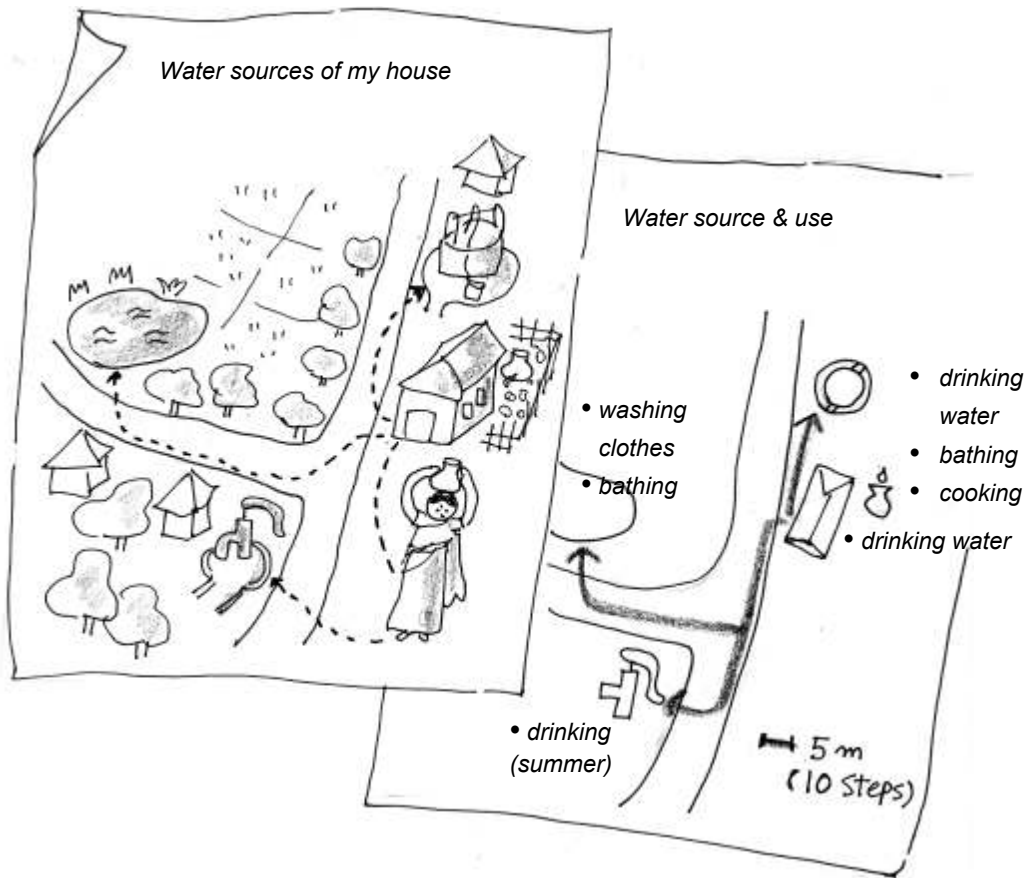
Preliminary Activity :“ Making Maps”

Hold a discussion on water source for domestic use.

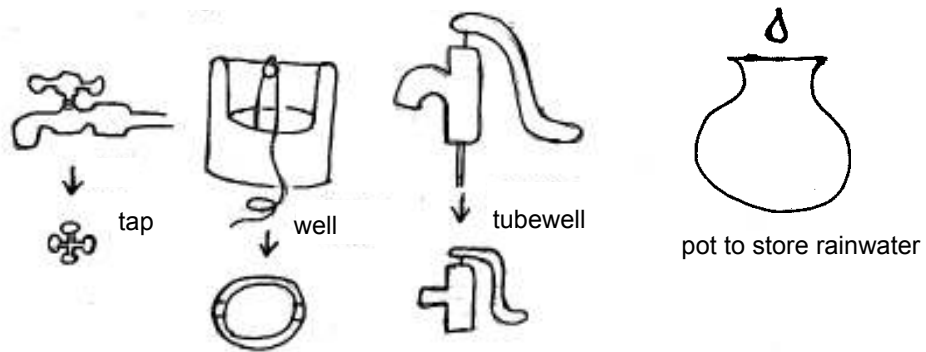
Ask the children to draw a simple map of their house and its surroundings, including marking out the water sources that they use. The distance of the water source from their homes should also be noted down in the map (this distance can be measured by walking steps). Make sure that the type of water source (hand pump, well, community tap, river etc) and for what that water is used is also mentioned.



Water Source Mapping



The signs below can be used to mark the various water sources on the map



Next Activity: “ Description of the condition of water sources”

Ask the children to visit the water source in their map and observe the surroundings carefully. They can check whether there are any pollution sources near the pond or water logging around the tap, hand pump etc. This information can then also be incorporated into the map.

Analysing the Information gathered

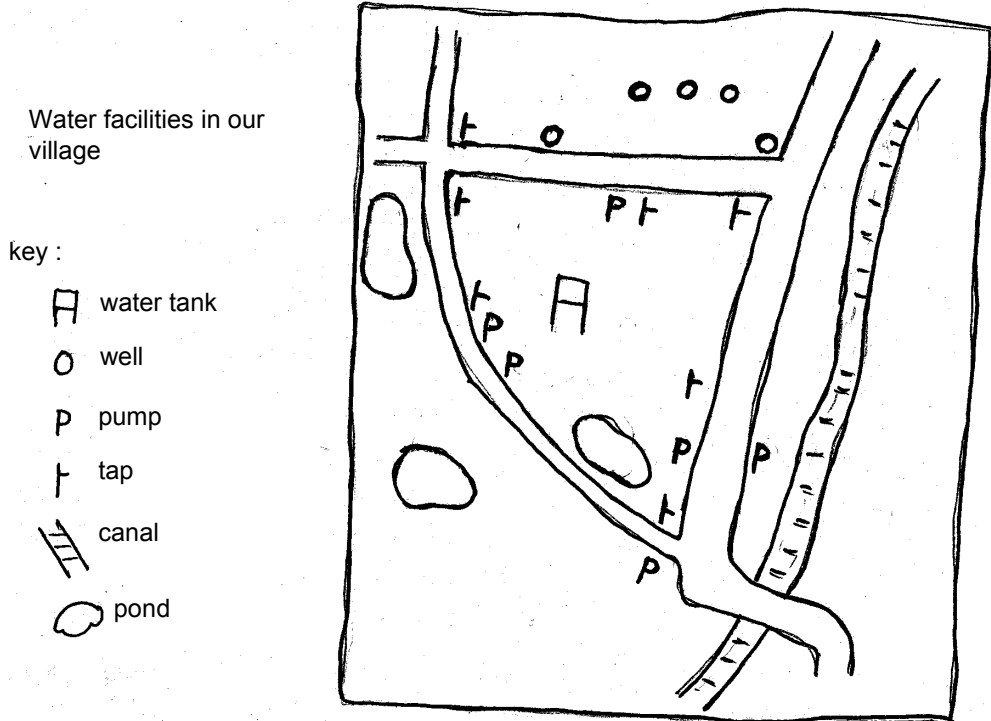
Ask the children to make a “water source report”. Based on the information gathered by hearing all the children’s reports, help the children to identify and clarify what kinds of water-related problems exist in the area.

Calculate the percentage (%) of water sources – what percent of each type of water source used is there? What percent of domestic water comes from which source?

Further Activity

In the same way a chart/map on “water facilities in the village” can also be made. It is not necessary to make very detailed maps. When the children are familiar with the basic outline of their village, only the main roads need to be drawn in and then the different water facilities can be marked.

“Simplifying map”



Feedback

Step 1 — Activity (B)



Through this activity children will learn own water sources and their access to those sources.

We can find whether there are any difficulties of water access & water problem in own area based on the survey result made by children.

Summary of Feedback from Teachers

	Swanirvar
1) Village	Fatullapur
2)Childrens' class / number	class V to X
3)Class / Period	2 periods. 1 period = 2 hours
4)Results (Prepared map & report of water sources)	It is in pg. 79
5)Interest of children	not mentioned
6)Teachers' opinion / difficulties	not mentioned

Summary Chart

■ Swanirvar

17 children of class V - IV prepared Water Source Map.

Their water sources are : Pond, Canal, Tap, Tubewell



■ Gandhi Vichar Parishad

17 children of class V - VII draw water source map. Their water sources are river, pond, tubewell, open well

Childrens' Work

Childrens' group of Swanirvar draw each map on their notebook. As a sample we share here Narayan Mondol's (class IX) map. He put distance also for each water sources.

Though the measure of the distance is not properly mentioned in his map; we can see easily his houses' water source and its distance. His family brings drinking water from Tubewell. This pump is situated 300ft. away from his house.



Reflections

Map making is one of the useful skill of active learning.

Since teachers themselves were not sufficiently confident to make this kind of resource map (like tree map, water source map etc). We all practiced the skill in ENRE teachers training a few months ago.

The teachers have learnt how to measure distance by steps, how to record necessary information on the draft map, how to symbolize the information on the map and how to convert the actual distances on ground into the proper length on the map etc.

After learning these basic things, most important thing is to make water source map together with the children.

Don't expect perfect map from the beginning. The map which Narayan made is all right as first step. If you want children to make a proper resource map, use Narayan's map as an example. Discuss with children how you can improve this map.

May be the other children would suggest that the scale should be more proper....

Then let's study how to decide the scale (the ratio of reduction in the length). Children can work out on Narayan's map again to make proper scale of the distance between his house to another house & to reach water sources. Children can compare the original map of Narayan and new version map. Discuss with children how information become more clear & visible.

Like this once you & your children can make a basic area map with proper scale, you can add several kinds of natural resources & information in the map time to time.

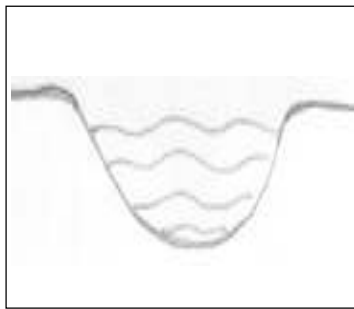
Eventually your map will be most valuable information in your area.

In a rural area, wider area may have to be covered by the map.



How far she has to go to collect water every day ? (Bankura District)

Step - 2



for collecting more information

 Lesson Plans

 Feedbacks



WATER — Step 2— Activity (A)

"Let's Make a Water Filter"

Focus on our drinking water — how we can make our water safe to drink

[🏠 for both rural & urban schools 😊 class 5 to 8 ✎ data collection, conducting an experiment 📖 safe drinking water (EVS), water purification (science)]



Objectives

- To grow awareness of safer quality of drinking water
- To learn about scientific & easy to adopt methods to purify water



Making a List of the Factors Contributing to the Present Situation

Have a look at the results of the previous activity (Step 1 - Activity A) on "Domestic water use" especially for water used for drinking and cooking. Divide the children into groups. Ask each group to make a summary of all the information gathered by each child in the group on the drinking water situation.

Points to inquiry :

- Water source for drinking water (throughout the year/rainy season/dry season)
- Is there any smell or a muddy colour in the drinking water?
- Is the drinking water treated in any way? (no treatment/boiled/filtered)
- Quantity of use of the drinking water (through the year/dry season/rainy season)
- Have any of the children suffered from diarrhea in the last 3 months?
- Have any of their family members suffered from diarrhea in the last 3 months? etc.



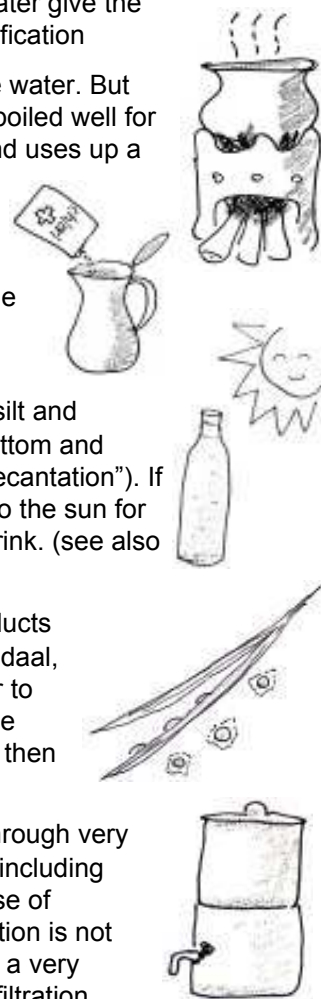
Summary of present situation

- Collect all the information summarised from each of the groups and collate this in the form of a bar- diagram, pie chart, graphs etc along the lines of the points mentioned above. (eg. A pie chart depicting the different water sources and the number of families using each source for drinking water)
- Hold a discussion on what can be understood from these results.
- Summarise what kinds of filtration methods are used in the houses of the children
- Find out what kinds of disease are caused by germs in water (like cholera, typhoid, gastroenteritis, diarrhea, dysentery, amoebiosis etc) [see Step 2 - Activity B]

Discussion and giving information : Water Purification

Discuss ways in which water can be made safe to drink. Later give the children some general information on methods of water purification

- **Boiling:** It is the best way to kill all the germs in the water. But after it reaches 100°C make sure water is boiled well for at least 10 minutes. It takes a long time and uses up a lot of fuel.
- **Disinfecting:** Using chemicals like chlorine kills all the germs in the water. Chlorine requires very careful measurement. If much is added, the water will taste bad, while adding too little may not kill all the organisms.
- **Storage:** The simplest method. During storage the silt and other particles/solids settle down at the bottom and the clear upper layer can be taken out (“decantation”). If this is kept in a glass bottle and exposed to the sun for at least 6 hours it will be safe enough to drink. (see also pg. 28)
- **Coagulation:** Chemical coagulants and some plant products (drum-stick seeds, water singhara, masur daal, tuvar daal etc) cause the particles in water to stick together or “coagulate” and sink to the bottom. The clear water on the top can be then poured out.
- **Filtration:** This is the process of passing the water through very fine sand to get rid of a number of germs, including ‘bilharzia’ (though for other germs like those of cholera, typhoid, gastro-enteritis, etc, filtration is not enough to remove them). Charcoal is also a very effective medium for water purification by filtration.

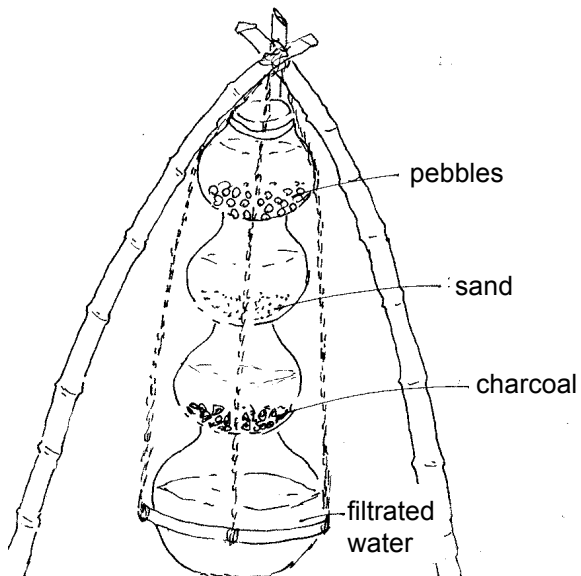


Try it out yourself ! “Making a water filter”

Let's try out a few different methods of filtration.

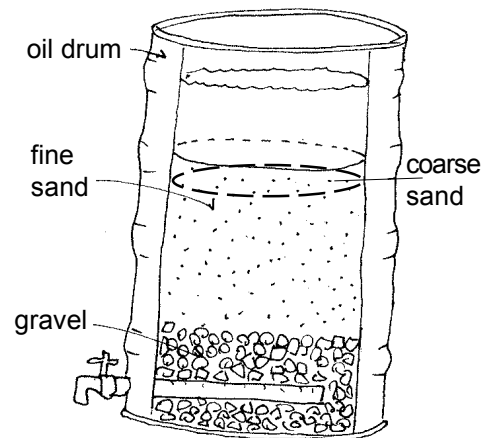
Divide the children into two groups. One can work on “pot filtration” and the other on “slow sand filtration”. Observe how water has been purified after filtration.

Let's try to make our "Water Filter"



'Pot filtration'

Four earthen pots having small hole in the bottom are put on the top of one another. This method is used traditionally in India and even slightly contaminated water can be purified.




'Oil drum sand filter'

A slow sand filter is one of the most common filtration method. After sometime, tiny plants start to grow in the sand, and these make a fine strainer which stops germs passing through the filter. (the coarse sand layer has to be replaced at 2-3 months intervals)

Feedback

Step 2 — Activity (A)



 Followed by Step 1 activity (surveying water & water sources for domestic use), this activity focuses on more drinking water.

Children also learn the process how to make the safe drinking water.

Feedback Summary

	Swanirbhar	Gandhi Vihar Parishad
1) Village	Fatullapur	We have not received any written reports from GVP. We have only received some charts prepared by them.
2) Childrens' class / number	class V to X	
3) Class / Period	2 periods 1 period = 1 hr 30 minutes	
4) Results (Result of the experiment on filtration)	Experiment on water filtration is still going on. Report has not been received yet.	
5) Interest of Children	no problem was faced to do the work.	
6) Teachers' opinion/ difficulties	Children have interests in performing these experiments. They have not done such kinds of experiment before.	

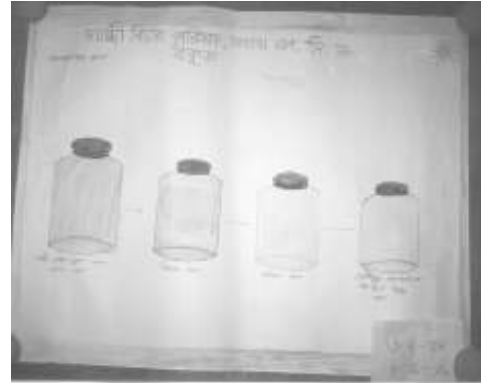


Summary Chart

■ Gandhi Vichar Parishad

17 children of class V - VII did experiment on muddy water settlement. They drew the result in the chart.

This looks incomplete because of missing necessary data like how many hours/day each step of settlement took.



From Childrens' Work

Examples are not available.



Reflections

According World Bank's data - 1995 in "Survey of the Environment' 98" (The Hindu), percentage of population in India with access to sanitation is 29% and to safe drinking water 81%. And if we see state wise, West Bengal has better situation for drinking water access both in urban (86.23%) & rural (80.26%) area. [Data : 1991 / Fifth Report p.121]

We can see from the childrens' survey that most of the household wisely choose several water sources for different purposes. Main water sources for drinking are tap, deep tubewell (hand pump) and river (which only Bankura's group showed). 75% of the surveyed household use river water as drinking water. We can understand this result, because when we visited Bankura earlier we saw the beautiful river flowing close to the villages there.

Probably water supply is less of a problem than lack of sanitary facilities. This can be one reason, compared step 2 activity B (hygiene & sanitation), this activity got less feedbacks from teachers.

Regarding the water purification methods, we got several feedbacks from teachers during ENRE network meetings.

Some teachers tried out 'water filter' with their children but most of their filters were set up one time as experiment, and not used continuously. Partly because it requires regular maintenance work and people were too busy to maintain these filters! Teachers said once the filters dried up, people were not willing to use it again.

And the boiling methods also seems not popular since it requires a lot of firewood & need to cool down it before drinking. Teachers told most of the children usually don't like the smell of boiled water.

Using seeds of drumsticks is an interesting way but we need more detail of methods & reliable data on it.

To solve the problem we found out SODIS (Solar Disinfection) method in a magazine 'Footsteps'. This is more practical & effective way of method 'storage' which we mentioned in our lesson plan (p.28). And this can be one of ideal solution for water purifying for safe drinking. (see teachers' note)

Teachers' Note**SODIS (Solar Disinfection) – easy & effective way of purifying water**

In countries where there is a lot of sunshine like India, the heat and light of the sun can be used to kill disease-causing organisms. This method is becoming very popular because it is cheap, simple and requires little work. Research has shown that if used correctly, the treated water is as clean as boiled water. The process is called Solar Disinfection (SODIS).

This method requires

- clear plastic bottles of approximately 1.5 litres (those used for bottled water are ideal)
- water that is not too cloudy

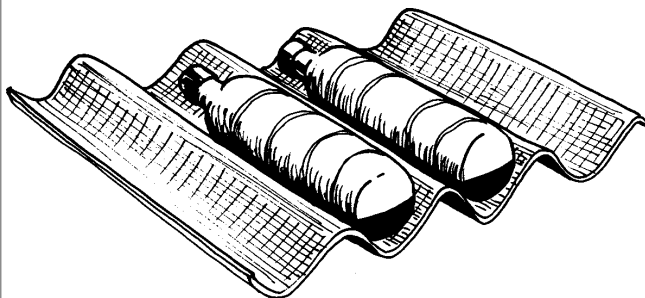


It is important not to use coloured glass bottles, as they do not allow enough sunlight into the water. Plastic bottles have very thin walls which allow the sunlight to reach the water. Cloudy water should be left to settle before use and filtered through a cloth or sand filter if still cloudy.

Fill a clean bottle about three quarters full, put the top on and shake it vigorously for about 20 seconds. This ensures there is plenty of air in the water, which reacts with the sunlight to help the purification process. Then fill the bottle to the top and place on its side where it will receive direct sunshine for several hours and where wind will not cool the bottle. A roof is ideal if it is made from metal sheets, tiles or concrete, rather than thatch (which could possibly catch fire).

Leave bottles in the sun for at least six hours, where they should become hot to touch. Then take the bottles inside to cool and be ready for use. If the weather is cloudy, bottles should be left on the roof for up to two days, according to the amount of cloud.

SODIS is simple to use and does not change the taste of the water. Nothing needs to be measured, and the water can be kept in the same bottle before drinking, reducing the risk of contamination during storage.



To increase the water temperature (which can be very useful during the rainy season or in cooler climates) one side of the bottle can be painted black. The painted side is placed underneath and helps the water temperature to rise more quickly.

There are likely to be few problems unless people use really dirty water, use dirty bottles, leave bottles in the shade or where the wind keeps them cool. One of the main problems may be getting enough bottles. This can lead to the use of, badly scratched bottles which keep out the sunlight.

[Extract from 'Footsteps - No. 51']



WATER — Step 2— Activity (B)

"Our Water & Hygiene Behaviour"

To know that many illnesses are closely linked to polluted water and poor sanitation. Let's see what we should do to avoid such diseases.

[🏠 for both rural & urban schools 🧑 class 5 to 8 ✎ listing, processing information, interview 📖 water & sanitation (EVS), water borne disease (health), language]



Objectives

- To develop awareness of hygiene
- To learn about water borne disease and its prevention



Raising questions, building interest – what is our present situation?

Discuss with the children what are the things we should do to maintain good hygiene and sanitation and why we need to do so.

Tell the children that they are about to discover what their actual behavior is with regard to hygiene. (This is not what it should be, but what it actually is!)
Make a list of points to check and make a summary of the results to see what the present situation is (see sample sheet attached).



'Awareness of Hygiene and arrangements for drainage of waste water - our present situation' example of questionnaire:

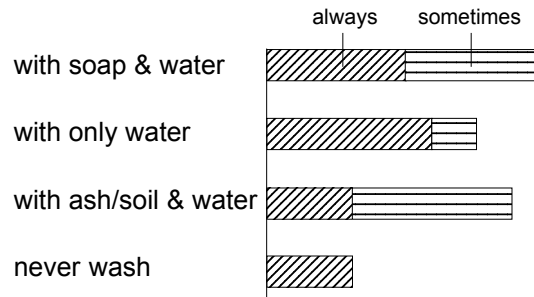
Check points		always	sometimes	never
Hygiene	A. I wash my hands before meals with a. soap & water b. ash/soil & water c. only water d. I never wash my hands before meal			
	B. I wash my hands before meals with a. pond/river water b. open well water c. hand pump water d. tap water e. rain water f. filtrated / boiled water			
	C. I wash my hands after defecating with a. soap & water b. ash/soil & water c. only water			
	D. My plate / utensils are washed by water from a. pond / river b. open well c. hand pump d. tap water e. rain water (tank)			
	E. I take bath by swimming in a. pond b. river			
	F. In our school we wash on hands with a. pond/river water b. open well water c. handpump water d. tap water e. rain water (tank)			
Sanitation	G. I urineate in a. bush / roadside b. pond / river side c. latrine / toilet d. other places			
	H. I defecate in a. bush / roadside b. pond/river side c. latrine / toilet d. other places			
	I. Our school has latrine / toilet (numbers)			



Collating the data

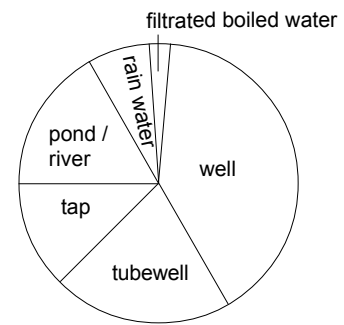
Put the results for each of the points into the form of a graph to visually understand our present hygiene habits situation.

Eg. Washing hands before meals:



class VI : 38 students

using water from



[both always & sometimes]



Collecting information – Common diseases in our area

- Have the children visit their local health centre/health workers and ask about common water-borne diseases and how they can be prevented. If they have a record of patients, ask them what the number of patients suffering from these diseases per month is (for a year if available).
- After they have collected the information, divide the children into groups. Ask them to summarise each disease (one disease per group) in the way shown.

Name of disease

- What it is ?
 - cause (why we get the disease)
 - symptoms (what happens to us when we get this disease)
- What to do (if we get the disease) ?
- How the disease can be prevented ?
- Seasonal occurrence (according to record of patients per month)



Interviewing the local health worker about water-borne diseases

Summary and giving children some information

What did the children understand from their findings regarding our present situation and the information collected on water-borne diseases?

Discuss the importance of our hygiene habits in avoiding many kinds of diseases.

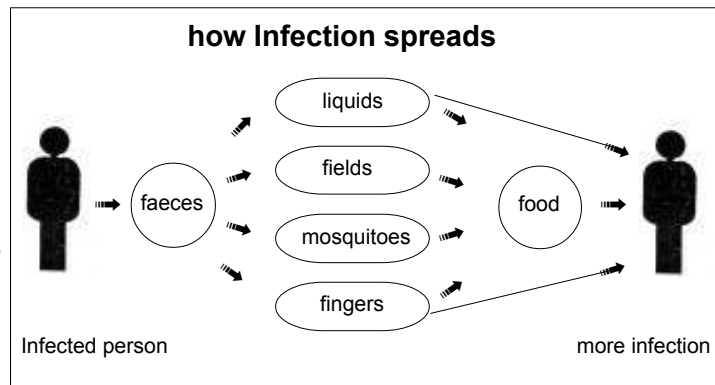
Give the children some information and summarize their findings.

→ Over 3 million children die each year from diarrhoea & similar diseases

(WHO – World Health Organisation)

→ The three main things which help us reduce disease in our families are

- clean water supply
- effective hygiene behavior (like the use of soap and water for washing hands, using clean containers for collecting and storing water etc.)
- safe disposal of human wastes (sanitation)



→ UNICEF has estimated that it is possible to reduce child deaths due to diarrhea by a quarter if a community is encouraged to follow all of these 3 points given above.

Improvement in sanitation and hygiene each contribute to about a 35% reduction. Increasing water supply (quantity) contributes about 20% and "safe" water (quality) contributes 15% of the beneficial effect. This shows how improving hygiene and sanitation is important to prevent water borne diseases.

[source : 'Footsteps no. 30']

Achievement / Success indication

If the children clearly understand


- the importance of sanitation and hygiene (because that would break the cycle of infection)
- that proper sanitation and hygiene habits should be encouraged at the community-level (because water is used commonly by all and each factor is interrelated)

then this activity has been successfully conducted.

Feedback

Step 2 — Activity (B)



 In this activity children are encouraged to find out first their present hygiene behaviour.

Considering their result teachers guide children to collect water related disease information from local health workers.

If children improve their hygiene behaviour and discuss with their family members about what they have learnt, then this activity can be said successful.

If necessary, children can ask school authorities to improve water facilities for washing hand / toilet by showing their study result. We are sure school authorities must be happy to listen such childrens' appeal.

Feedback Summary

	Swanirbhar
1) Village	Fatullapur
2) Childrens' class / number	class V to X
3) Class / Period	3 periods 1 period = 1 hr 30 minutes
4) Results (List of common diseases in your area)	Children have prepared the list.
5) Interest of Children	Children have interest in doing their work.
6) Teachers' opinion/ difficulties	The work is good. If children could become aware of the common water related diseases.



Summary Chart

Teacher Tarun Mondol made summary list on common diseases of children. These information were collected by 10 children. (Information source is not clearly mentioned).

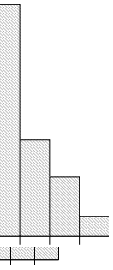
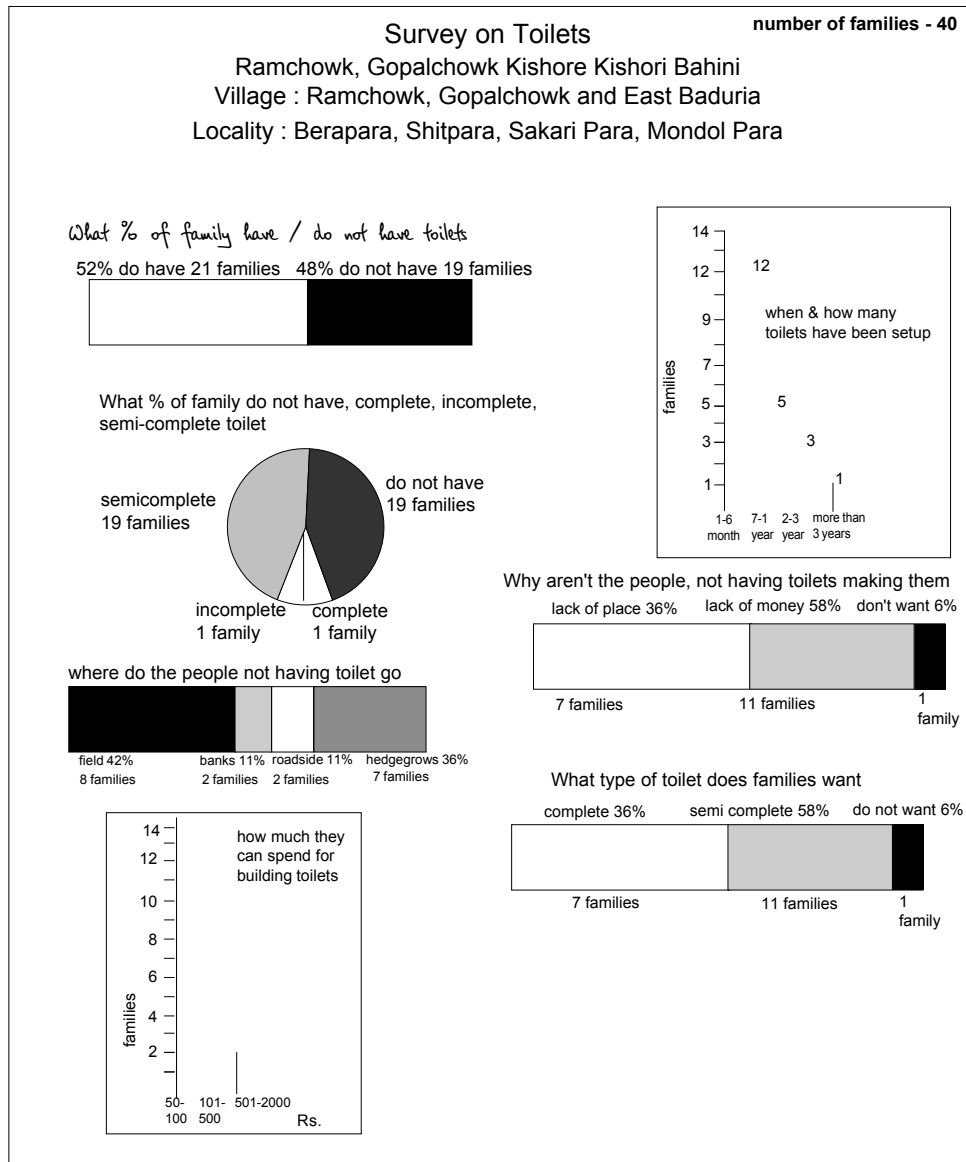
Name of diseases	Causes	Treatment	Recommendations	Time of occurrence
1. cough cold	Temperature fluctuations	Septon, Paracetamol Diazine	Take precautions against cold	Change of season or unfriendly climate
2 Diarrhoea	Water borne, spicy food upsets	Metronidazole, Diazine	Drink boiled water	Anytime of the year
3 Stomach upset	Water, consuming loosely kept food	Cleanliness, boiled water	Take necessary precautions	Seen during summer & monsoon
4. Ring worm	Improper foods, dirty hands & feet, dress, doing toilet hither and thither, walking barefeet	Albendazole, Mebendazole	Cleanliness, properly cooked food, keeping feet covered	Mostly seen in monsoon
5. Allergy	Dirty habits	Benezene banzoit lotion, septon tablets	Cleanliness, drink neem leaf soaked water	Mostly in monsoon
6. Wound	Acting without caution	Solution of Microchrome or benzene in water, septon, soframycine powder	Acting continuously	
7. Minor cut	Acting without caution	Dettol, Betadene	Acting with care & caution	Mostly seen in winter
8. Burn	Acting without caution	Burnol, Septon tablets	Acting with care	Mostly seen in winter
9. Stomach ache	Indigestion	Administering ice bag, brufen, paracetamol, diazine	Selective intake of food	Mostly seen in hot summer months

[note : unnecessary use of medicines is rapidly increasing in rural areas also, some examples of this can be seen from this study]

■ **Gandhi Vichar Parishad**



A group of children of Gandhi Vichar Parishad conducted survey on toilet facilities. They surveyed on 40 families and found out about half of households don't have toilet facilities.

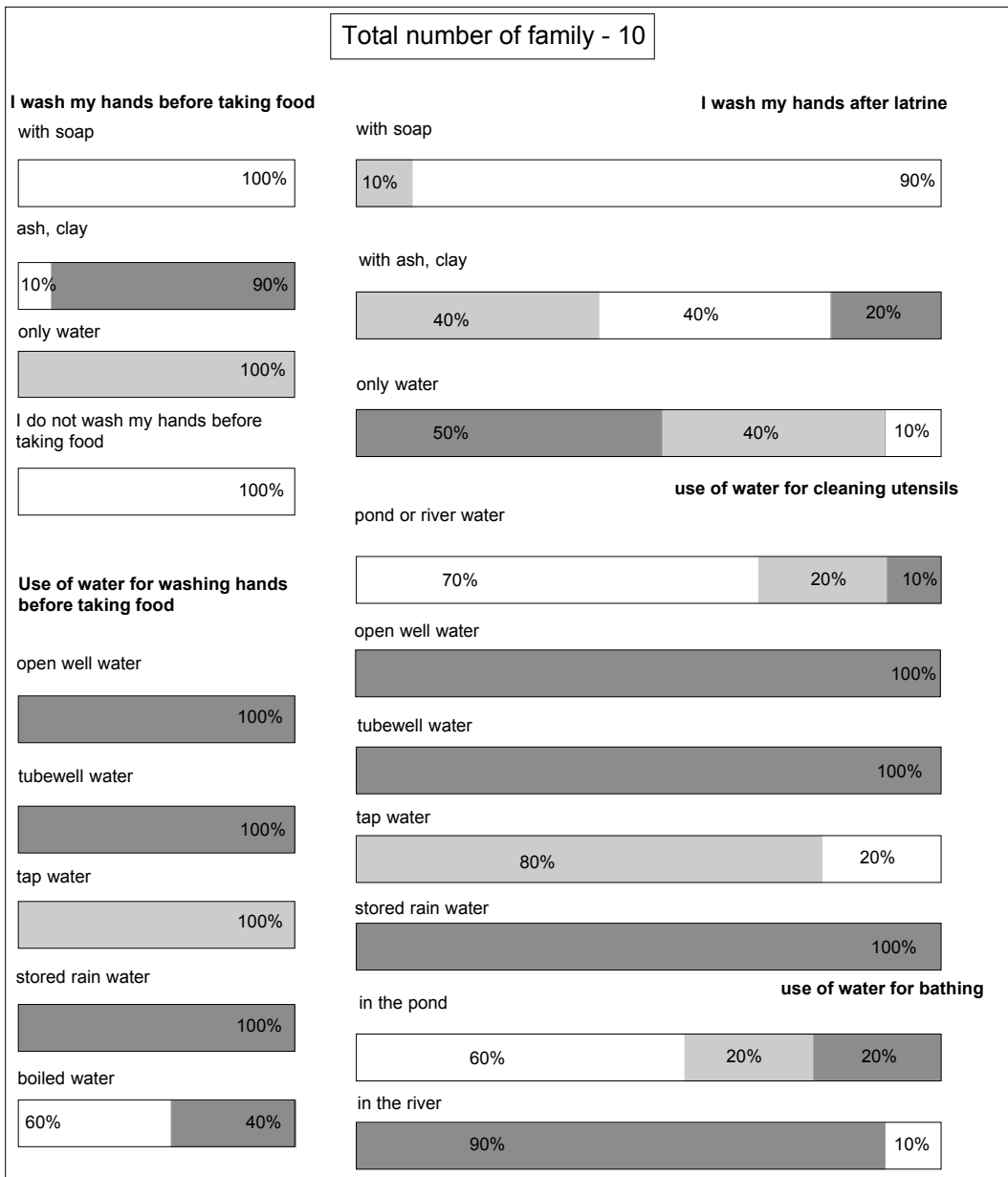


■ Swanirvar



2 groups of 17 children (class V-IX) summarize their own hygiene behaviour in water using.

ENRE reorganized the result of each bar graph according to the order of frequency; always sometimes never



Children's Activity

From childrens' hygiene check list, we put together the results of Kartick Mondol (class VII, Swanirvar) and Rabin Mondol (class VII, Swanirvar) from their notebook.

What do we want to know	Everywhere		Seldom		Never	
	Kartik	Robin	Kartik	Robin	Kartik	Robin
A) Wash hands prior to take food 1. with soap & water 2. with ash, clay & water 3. only water 4. do not wash at all	✓	✓	×	✓	×	✓
B) For washing hands prior to having food we use 1. pond, river water 2. well water 3. tap water 4. tubewell water 5. stored rain water 6. boiled water / sterile water	✓	✓	×	✓	×	
C) For washing hands after toilet. We use, 1. soap & water 2. ash, clay and water 3. only water	✓	✓	×	✓	×	✓
D) For washing utensils we use 1. pond & river water 2. water of well 3. tubewell water 4. tap water	✓	✓	×	✓	×	✓ ✓
E) For bathing we use 1. tap water 2. pond water 3. river water	✓ ✓	✓	×	✓	×	×
F) For washing hands in school we use 1. pond and river water 2. open well water 3. tubewell water 4. tap water 5. stored rain water	✓	✓	×	✓	×	✓ ✓

G) We urinate 1. at roadside 2. beside river or pond 3. toilet or latrine 4. any other place	✓	✓	x	✓ ✓ ✓	x	
H) We shit 1. at roadside or beside hedges 2. beside pond or river 3. at toilet 4. any other place	✓	✓	x	✓	x	✓ ✓

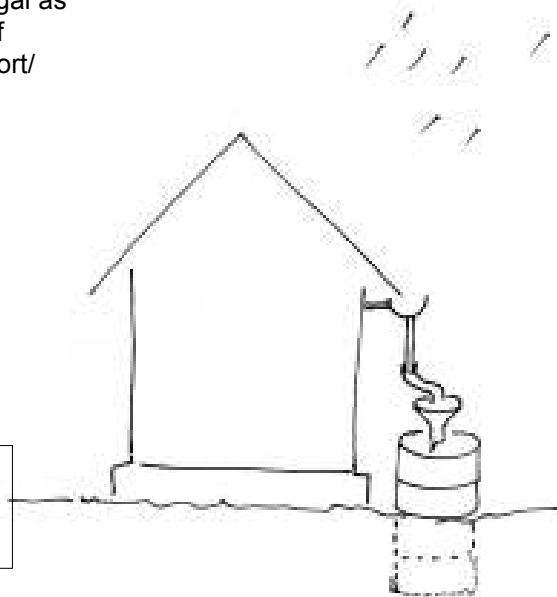
Reflections

It is said 80% of diseases are linked with contaminated water in less developed countries. We can see several articles time to time in newspapers related this issue like water borne disease, water scarcity for sustain proper hygiene etc. Also, now a days we often see the article about rain harvest (roof water harvest) for domestic use purpose to reduce water scarcity.

It is important to keep childrens' conscious and attention on this kind of issue even after finish conducting topic related activity. It might be a good idea to set up 'water clipping board' in our classroom for current information. If bigger children (class VI ~) they can collect the related articles by themselves from newspapers and keep own 'water clipping file'.

CSE data shows West Bengal has slightly better 'population to sanitation' ratio (31.5%) in comparison to that of India (23.7%). But the gap in sanitation facility between rural (12.3%) and urban (78.6%) area is huge in West Bengal as same as other states [source : "CSE, State of India's Enviroment 5 - The Citizens Fifth Report/ Part II : Statistical Database" p.124]

About 20000 lt. water can be collected from a 10-12 ft. wide and 15-20 ft. long (4m x 5m) roof in a year.



Step - 3



for creating child oriented activity



Lesson Plans



Feedbacks



WATER — Step 3 — Activity (A)

"Pond Management"

A Pond is a very common feature typical of our area. Let's check and see how we are using our water. We will look into the condition of the water in our ponds and see whether or not it is being polluted...by us.

[🏠 mainly for rural schools 😊 class 6 to 9 🗺️ mapping, data collection & analysis, measurement, social work 📖 water resource management (EVS & social studies)]



Object

- To learn about better management of common water resources like ponds.
- To encourage children to join community effort for better local environment.



Raising questions, Building interest

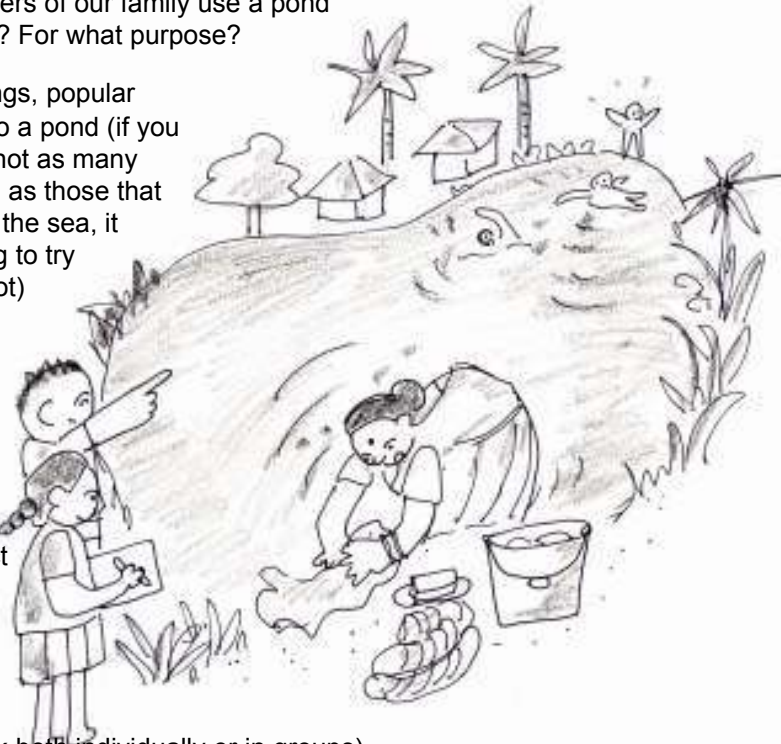
- If you have done the activity on "water source maps" in Activity 'Step 1-B', look over the maps made again hold a discussion with the children on them, touching especially on the ponds in their areas:
 - Why are there so many ponds in our area (in some areas there may be only a few, again, why is that so?)
 - Do we or members of our family use a pond everyday or not? For what purpose?
- Collect poems, songs, popular sayings that refer to a pond (if you find that there are not as many that refer to a pond as those that talk about rivers or the sea, it might be interesting to try to figure out why not)



Collecting information

Ask the children to each look into the pond nearest to their home. They will collect data on the pond by sketching, measuring, interviewing the users and using their own observational skills.

(They can do this work both individually or in groups)



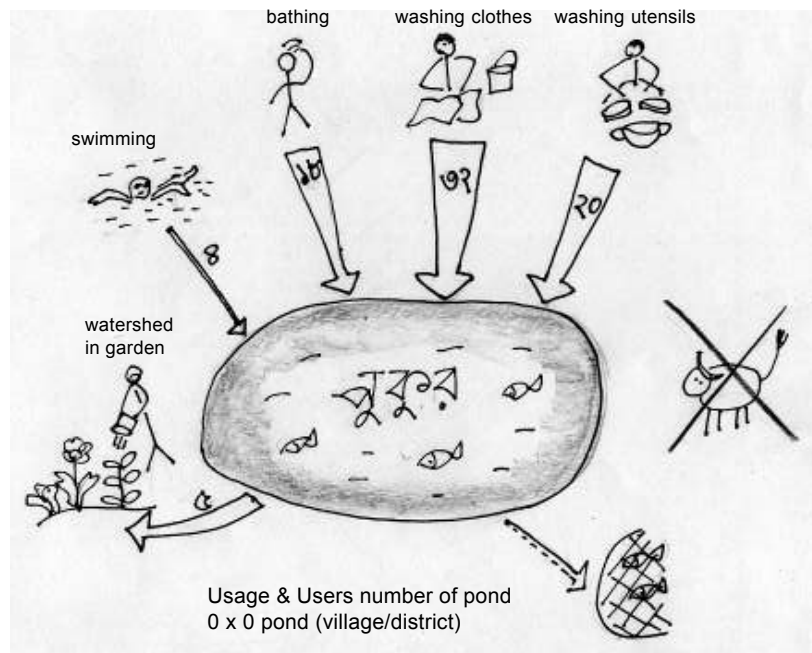
The key points are —

- **Site Sketching**

- Ascertain the location of the pond (near the houses, among the rice fields, by the road side etc)
- Note the size and shape – any interesting designs?
- Note what trees and plants surround the pond or are found on the surface of the pond
- Observe and mark what the condition of the pond bank is – is it covered with plants? bricks? concrete ? or eroded?

- **Your own Observations & Interviews**

- How many people are using the pond and who are they? For what purpose do they use the pond and what are the other materials they use together with this (eg. Soap, detergent, fish feed, irrigation pump etc.). When do they use the pond? How does the usage vary with the seasons?
- What is the condition of hygiene and sanitation around the pond? (any dumped garbage, plastics, human or animal wastes etc?)
- Is there any sewage pouring into the pond? How much and from where?
- Can we see any animals/birds/insects surrounding the pond or on the pond surface?
- What is the history of the pond?
- Study the water quality and quantity of the pond (is the water becoming more dirty as compared to earlier, how the quantity changes with the seasons – like drying up in the summer etc)
- Does the pond serve any social function or are any religious activities (pujas) held at the pond?



Summary and Analysis of the Data

Let all the children share all the information they gathered with the whole class. Then have them collate the information into charts, graphs and diagrams following the points of inquiry detailed above.

Analysing

- Are there any common/ community rules for how the ponds should be used?
- Are there several different pond designs? Is there any typical pond design in your area? How can you recognise a “well-designed” pond?
- What are the causes of pond water getting polluted? If chemical fertilisers, pesticides, detergent, oil or organic wastes are allowed to be in the water what happens?
- What can we do to protect the water of the pond?
- Do you have any ideas for improving the area surrounding the pond?
- “We have too many mosquitoes because of the pond” – Do you think that this is true?

How people use the ponds



washing clothes



for gardens and duckery



to catch fish for meals



for community fishery



as swimming pools for schools of small towns

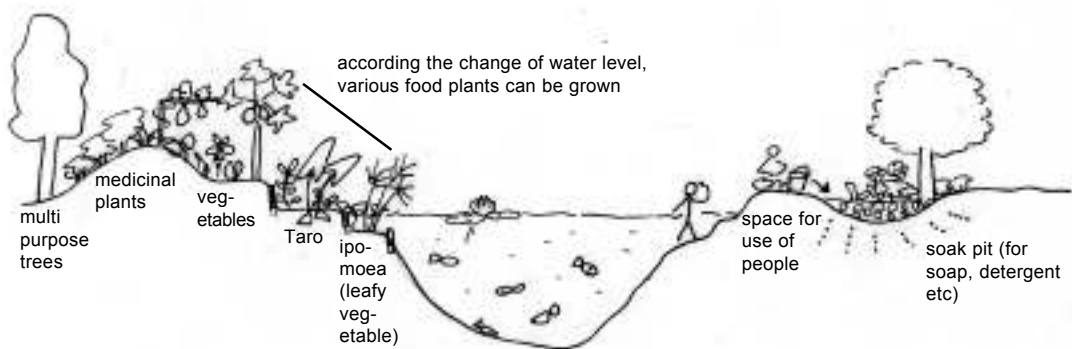
Take Action !

- ➔ Have the children make a pond design and a plan that can be recommended to the community. They can include various ideas for better pond management as well.

Work on and try to implement some of these ideas with the children in several ponds in your area.

There are many other things we can do too – like cleaning up and picking up some of the garbage thrown near the pond, planting trees and herbs near the bank of the pond, making posters to spread awareness of the importance of good pond management etc.

Get the children to make a report of this activity and write about what would be expected to happen after it and send it to the ENRE network to share the information and ideas with others.



An example of a good pond design and its management



Pond bank is very valuable place, where various kinds of plants & living things can exist.

Using this space people can grow edible aquatic plants(rice, spinach etc) alongwith several kinds of vegetables & fruits.

An example of a well managed pond in a village (South 24 Parganas)

→ **Some Ideas for Urban School Children**

- Making map for pond & Lake park :
Children can make own guide map for pond, lake and other water related park / interesting places in own town. Along with the facilities of the park, put some observation information like situation, trees & birds and other creatures which can be seen in the place.
- Historical map of ponds in town
There are a lot of ponds & marsh land which turned into reclaimed land for building houses or factories etc in town. Children can go for interview with senior community members to find out that how landscape has been changing over time.
- Find out the solution for dumping trash surrounding the pond :
Most of the ponds in urban area are not any more water resources for domestic uses. Instead, their situation is quite devastated by dumping a lot of wastes of polythene packets & garbages.

Children can survey the environment of ponds & lakes in town and take same action to improve the situation.

(see also expert's view point p.73)



Feedback

Step 3 — Activity (A)



Followed by previous steps' activities children now understand which causes damage their water quality of pond, based on their survey results. Through this activity children are encouraged to tackle about better use of community water source – pond.

In this lesson plan several ideas of management of ponds are mentioned but teachers can encourage children to develop more suitable ideas for own pond situation.

Feedback Summary

	Swanirbhar
1) Village	Fatullapur
2) Childrens' class / number	class V to X
3) Class / Period	2 periods 1 period = 1 hr 30 minutes
4) Results (stories, poetry, songs, maps of various ponds, answers to questions, reports of children for developing ponds of the locality collected & assembled by students)	Students have collected stories, songs, poetry. They have not prepared the maps of various ponds. 20 students have collected information on one pond. They have not worked out anything to develop the pond.
5) Interest of Children	The students enjoyed doing the work.
6) Teachers' opinion/ difficulties	The students did not get any cooperation from the neighbourhood people during their information collection. Most of the neighbour did not bother to answer them since they were very small.



Summary Chart

We could not get any summary chart on community use of Pond.



Childrens' Activity

We could not get any childrens' own design of community pond for better use.

Teacher Tarun Mondol (Swanirvar) worked with children on several questions regarding pond use. We extract this here from the notebook of Kartik & Rabin.

Questions	Kartik Mondol	Rabin Mondol
1. Why there are so many ponds in the village ?	The village need the ponds, so there are so many of them.	People can bathe properly, catch the fishes and eat them, or sell them off in the market, earning some money. For these reasons we have so many ponds. Beside this, water is drawn by pumps to the agricultural fields when there is any need.
2. Are the ponds used regularly? For what purpose and how many people use the pond ?	Presently no one use the pond.	Some go to the pond while others use tap water. We use the pond water for agriculture, cleaning the cattle, watering the garden etc. Everyone of us use the pond for the above purposes.
3. Do you write tales, poems or lyrics on the pond by your homestead ?	Not mentioned.	He has written a tale on the pond beside his homestead.
4. Location of the pond (by the homestead, beside the agricultural field)	Beside the rice field	Beside the rice field
5. What is the are of the pond ?	45 ft long, 35ft wide, 7ft deep	30ft long, 20ft wide, 10ft deep
6. What trees can be found out he banks of the pond ?	Date palm, coconut, betelnut, shirish, drumstick etc	Not much trees are found on the pond banks. Some natural vegetation, herbs are found there.
7. Condition of the pond bank ?	Broken, many trees are present on pond banks.	The bank has been properly mended.
8. How many people use the pond ?	50 people	Number of people is not known but approximately 50-60 people use them. All of them are our neighbour.s.

9. For what purposes water of the pond is used ?	Washing of cattle, bathing, cleaning of utensils, watering the garden ?	Used for bathing. The owner of the pond use the water for irrigation. During crisis, pumps are used to draw water for agricultural purposes. The nearby residents use the water for cooking, cleaning of utensils, washing the cattle etc.
10. In which season the water of the pond is mostly used ?	In monsoon	In summer
11. Is the surrounding of the pond hygienic ?	No	No
12. Does any sewage pipe lead to the pond ? If yes, then from which homestead does the sewage pipe come from ?	No.	No. But water contaminated with agrochemicals, drain to the pond during monsoon.
13. Are there any insect or living things visible on the water surface ? If yes, what are they ?	There are many organisms on the banks & on the water surface. They are water bugs, water strider, spiders etc. Besides, frogs & snakes are also there.	Organisms are there on the banks and in water. They are water strider, water bugs, spiders etc.
14. Write on water quality and quantity (water is more dirty / pond has dried up / previously pond did not dry up)	This is summer so water has dried up.	Water is more dirty than before.
15. Write the history of the pond. (who dug it / at which time / is there any specific tale associated with its digging)	Some people of 'Sardars' have dug the pond. No mishaps took place during its digging. It was dug for fish rearing.	I took help from my grandma to write the history of this pond. The pond was dug by grandma's grandfather. It is also 200 years old. No serious incidents took place during its digging.
16. Is there any social significance or importance of the pond.	Yes	No
17. Is there any general rule for using the pond ?	No.	No.

<p>18. What are the reasons for the ponds getting polluted. What happens if chemical fertilizers, chemical pesticides, detergent soap, petroleum oil get drained into the pond.</p>	<p>Pesticide runs off, detergent soap etc pollute the pond water.</p>	<p>The agrochemicals run off get drained into the pond, and cause pollution since it is situated beside the rice field. Chemical fertilizers, pesticides, detergents, soaps etc cause the water to get polluted. As a result, the people who bathe in the pond develop skin diseases.</p>
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Reflections

Observation and keeping records on the present situation of each community pond had been done nicely by several children's groups.

As we see in the record of two students, Kartik & Robin, if we observe a lot of wastes & unhygienic situation surrounding the pond or if people use the same pond for bathing as well as for cleaning of cattles, something has to be done for better water source management.

But it seems difficult for both teachers & children to take action beyond their survey work. In ENRE teachers meeting, we got the report that one of the children's group cleaned up the bank of a pond in their village, but their action took place only one time and could not reach the level of community movement.

We need more & more case studies of childrens' involvement for the water resource management in the community. (see expert's view point too).



'pond beside our house'
(Manosi Chatterjee, class III, Chandannagore)



WATER — Step 3 — Activity (B)

"Water Source Improvement"

Observe the sites of open wells and hand pumps in your area. Is there any wastewater around? Let us try to improve the area surrounding our water sources and see if there is some way we can reuse the waste water. Even we children can do it.

[🏠 for both rural & urban schools 🧑 class 6 to 9 ✨ observation, group work, social work, drawing 📖 water & hygiene (EVS)]



Objectives

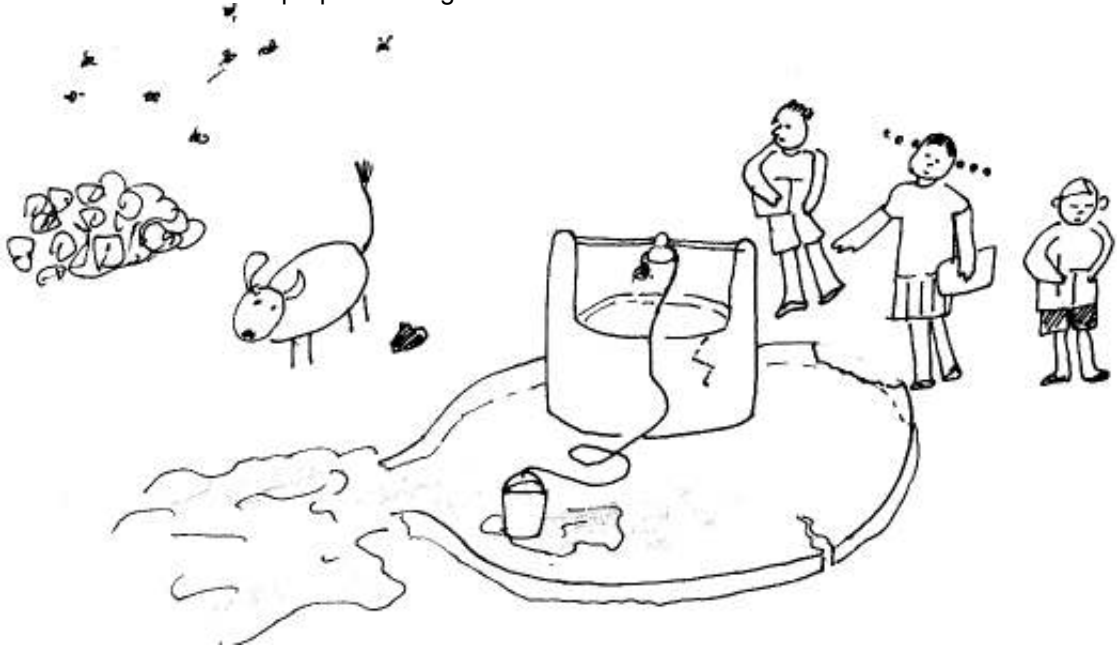
- To analyse the water source situation.
- To learn about 're-use & recycling action' for used water.
- To create childrens' involvement in community water management.



Raising questions, Building interest

If you have done the activity of making a water source map given in 3 – 1- B, look over the map once again. Notice the descriptions you made of the condition of the area surrounding the different water sources – wells, pumps etc. What is the most common condition of the water source location?

Walk around the school compound and observe the water sources. Discuss what kinds of problems you think might occur – does the waste water accumulate and stand? Is there proper drainage?





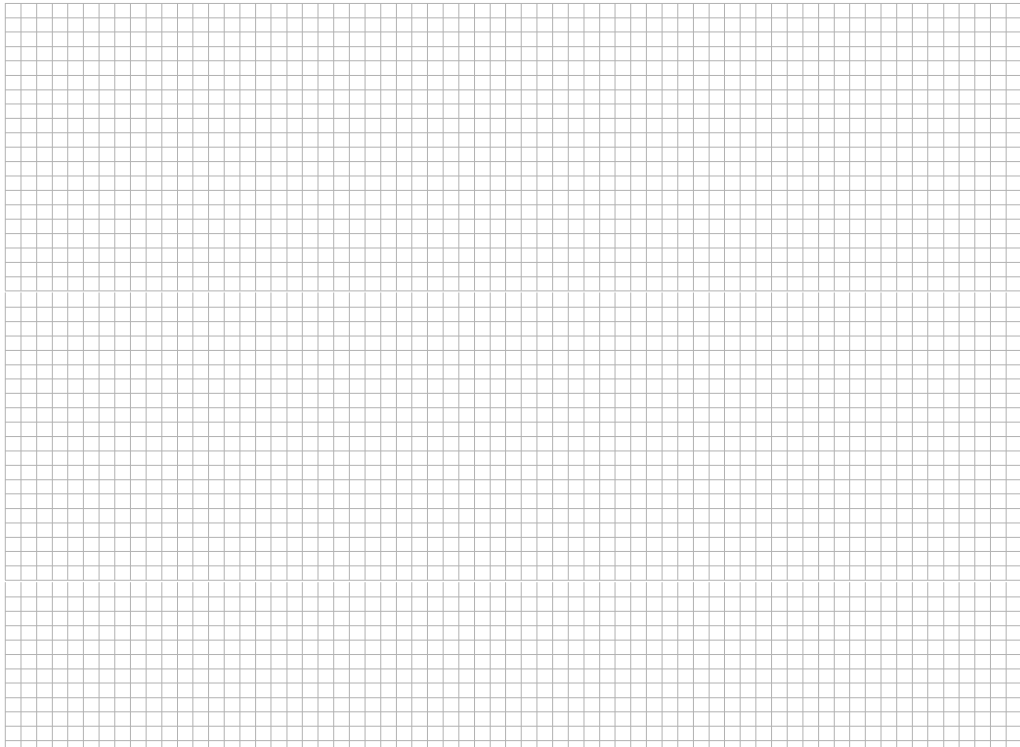
Data Collection

For each open well and hand pump, have the children collect information regarding

- the risk of water contamination and
- the state of the drainage system

Discuss with them what points they should work on. Make survey sheet together. Think about the design of the survey sheet that would help us judge how much work is needed to improve the condition of the water source.

Water Source – Site Survey Sheet

<input type="checkbox"/> open well / handpump	ID No. (on the map etc.)
<input type="checkbox"/> Location :	
site	village district
<input type="checkbox"/> How many families are using private / community	
<input type="checkbox"/> Name of the students who collected :	
name	class
school district	
teacher's name	
<input type="checkbox"/> Survey date	
Sketch of the watersource site [my steps = 10 m]	
	



Check points	yes	no
1. Is there a latrine within 10m of the well / handpump ?	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there any other source of pollution within 10m of the well/handpump ? (eg. animals' rubbish, animal & human waste)	<input type="checkbox"/>	<input type="checkbox"/>
3. Is the water stagnating within 2m of the well/handpump ?	<input type="checkbox"/>	<input type="checkbox"/>
4. Is the drainage channel broken ? or there is no drainage ?	<input type="checkbox"/>	<input type="checkbox"/>
5. There is no or very narrow cement platform around the well/handpump ?	<input type="checkbox"/>	<input type="checkbox"/>
6. Are there any cracks in the cement platform around the well / handpump (which could permit water to enter the well / handpump ?	<input type="checkbox"/>	<input type="checkbox"/>
7. Are the roap & bucket kept in a place where they may be contaminated ? or pump is sometimes broken or out of order.	<input type="checkbox"/>	<input type="checkbox"/>
8. Water dries up during dry season.	<input type="checkbox"/>	<input type="checkbox"/>
9. Many mosquitoes and flies can be seen surrounding.	<input type="checkbox"/>	<input type="checkbox"/>
10. The water is becoming dirtier compared before (now not for drink)	<input type="checkbox"/>	<input type="checkbox"/>
total	()	()

Total number of 'yes' — contamination risk & requirement of improvement is high. (> 8 very high, 7-5 – high, 4-2 – intermediate, 1-0 – low)

Result : Point

Decision : really need improvement / better to improve / good condition

Idea / recommendation for improvement (sketch, drawing etc)

Activities taken by us

date : who did what activity & how ?

date : who did what activity ?

..... :

Follow up / Improved points after our activity.

..... :

..... :

owner / contact person for this water source

name village

name of the recorder

class school

Analysing data gathered and creating ideas

Based on the results of each of the survey sheets, think about what kinds of improvements are necessary and what we can do about it. What is our priority?

Let the children be free to come up with as many creative ideas about how the site of our water source can be improved. On the survey sheets, an idea or ideas that are suitable can be written down for the different sites.

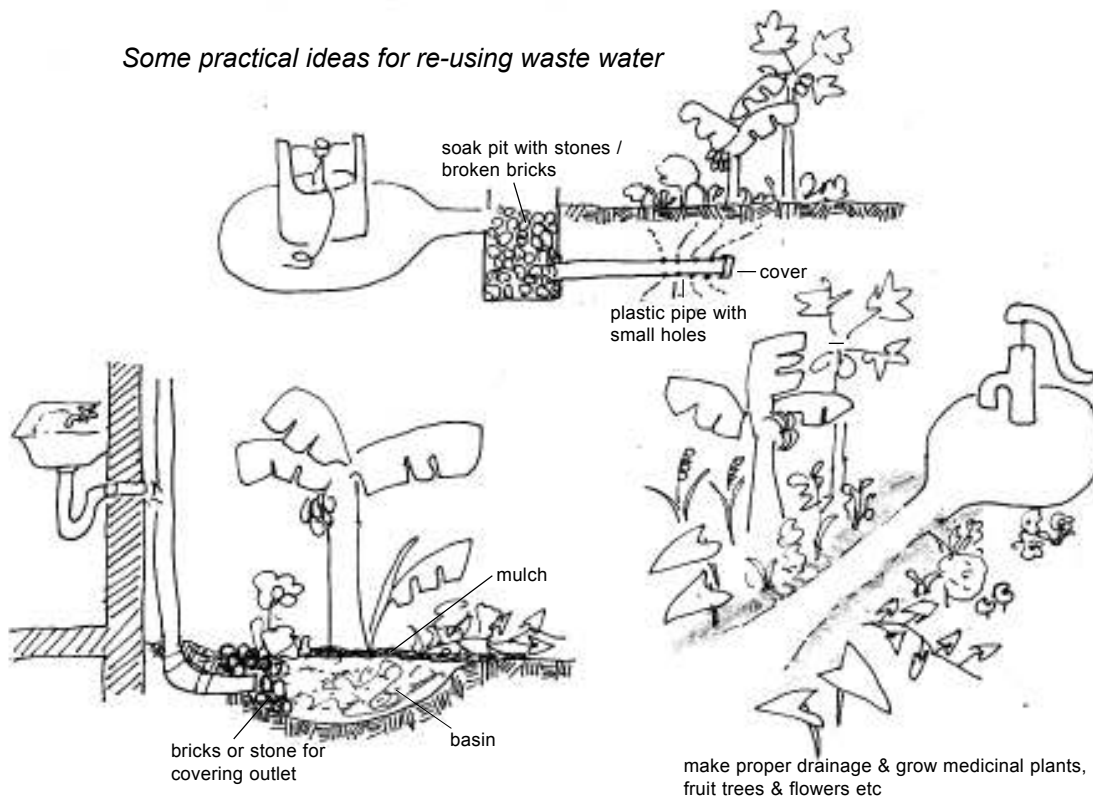
Take Action !

Try out as many of the ideas that we recommended for water source site improvement yourselves. If they work in groups, even small children can be able to participate in bringing about changes to improve the site. We can help to clean up the area, make channels for proper drainage, practice re-using waste water, plant trees and herbs around and many more things. These are just a few ideas. But remember, if too much detergent is being used at a particular water source, then it is better not to grow any vegetables there!

If there is a common well or pump where the structure itself needs to be repaired whom can we ask for help?

Let us check on the management system of the site and see how the community has maintained it so far.

Some practical ideas for re-using waste water



Some ideas for Urban School Children

- Visiting 'Water Treatment Plant' :
Organise a small study trip with children to visit 'Water Treatment Plant' in your town. Later children can write report about from where & how water reaches to each household tap. This can be interesting article for school wall magazine etc.
- Campaign for 'troublesome taps'
In the streets, we often observe a lot of water leaking or just running wastefully because of the broken taps. Ask children put red mark for such taps on their water source map, then try to talk with community authorities for repairing taps.
Encourage children to renew their map time to time. Making posters is also useful way to grow community awareness

'conserving water before its too late, its the only way for life to stay'




*A message from the children of India participating in the "Children's Earth Summit" Aug 26-31, 2002
(for further details log on www.vshiva.net or www.peopleearthsummit.net)*

Feedback

Step 3 — Activity (B)



 This activity tries to create childrens' involvement for water source management and grey water (used water) recycling.

First children have to check up their water source situation according to the check list then they will take action for improvement of water source situation.

On the process they will learn the community responsibility for managing common natural resources like several kind of water sources.



Feedback Summary

	Swanirbhar
1) Village	Fatullapur
2) Childrens' class / number	class V to X (20 students)
3) Class / Period	3 periods
4) Results (format for analysis of water resources, plans for improving the water resources, children's report)	They have prepared the format for analysis of water resources. They have made plans to improve the water resources of the locality. Children's Report Sprinkled bleaching powder around taps of water. Pheneol is applied so that mosquitoes cannot develop.
5) Interest of Children	The students enjoyed doing the activity.
6) Teachers' opinion/ difficulties	The faced many questions in doing the activity.



Summary Chart

We have not received any summary charts.



From Childrens' Work

We expected childrens' action report for improving water source, like cleaning pond's surrounding, growing fruit trees & herbs using water surrounding hand pump well & tap. But unfortunately no report is available.



From Teachers' Report

Swanirvar, an NGO who is working in North 24 Parganas district, had been already conducting youth group activity 'Kishore Kishori Bahini' before they joined ENRE Network. They did not try out ideas in this activity, but we asked them to share their previous experience related on water resource management.

■ Report from Swanirvar

Kishore Kishori Bahini have done the water purification activity. Previously, the children used to clean up the village for one day. But presently they have decided to do the work 4 times a year with the help of the village residents. They have planned themselves, that when the village cleaning programme will be done, how many people are needed, from which point it will start or end and what equipments are needed. Among this programme, there are activities like, paving and cleaning the drains, clearing the banks of ponds etc. Bleaching used to be applied at all handpumps sites in eight villages, but presently this activity is carried out in two villages only, since arsenic has been detected in 80% of the handpumps. Therefore in these handpumps application of bleaching has been stalled. A few deep tubewells are there in the locality and now they are used. An activity to supply arsenic free water will commence. [by Samir Biswas]



Reflections

We don't expect big change from the beginning, teacher can encourage children to start from own houses, or teacher can work out together with children in school yard.

Let's start from small point & manageable scale.

For example, growing vegetable with waste water from kitchen. Choose easy grow vegetable & fruit tree like bean, papaya etc. Same way, children can try out in their home garden and school garden.



small vegetable gardens using waste water from kitchen (Chandra, Bankura)



(Chandra, Bankura)



(Birbhum)

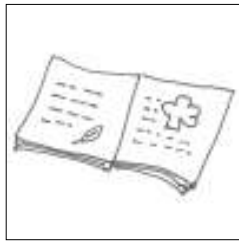
Then children can work out for community water sources. We can often see waste water stagnate surrounding handpump, tap & well like in photos.

These areas are very dry and people say that they can't grow any vegetable in summer season.

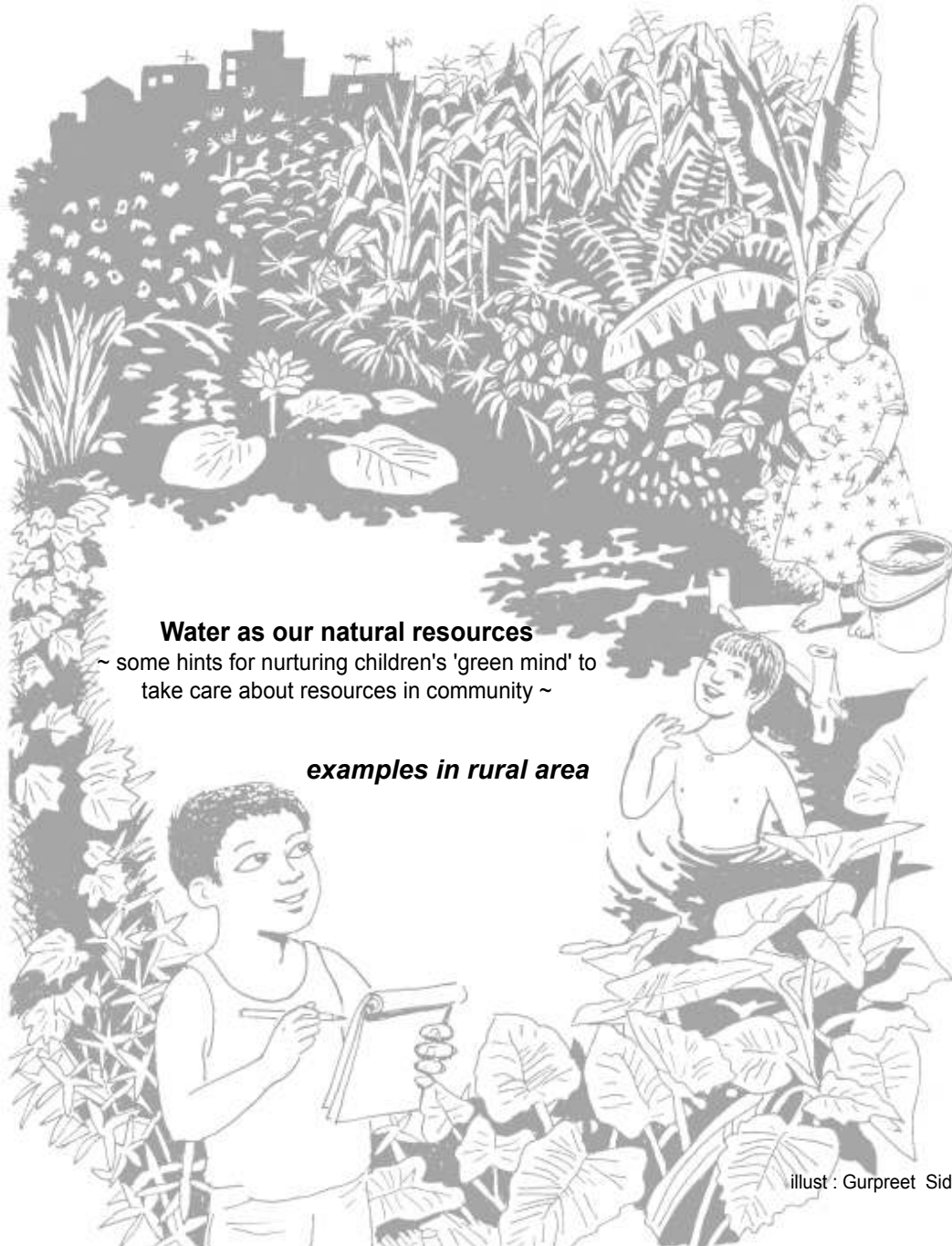
But water is here surely we can re-use it.

Let's take action !

Resources



for strengthening your guiding role



Water as our natural resources

~ some hints for nurturing children's 'green mind' to take care about resources in community ~

examples in rural area

illust : Gurpreet Sidhu

ENRE experience shows teachers can manage well upto survey activities with children. But it seems a little bit difficult for them to go beyond that & to make linkage into children's actual involvement for better water resource management.

Through the first 'expert's view point', you can find out valuable hints to create children's involvement are in example of local peoples' effort and traditional knowledges & practices. Villagers have been giving a lot of care and respect to the ponds, though such a culture is disappearing slowly.....

'A Pond right in the middle..... '

by Subrata Kundu

"You don't expect water in this dry stretch of earth here", comments a picnicker. "Let's dig in a bit as the tribal old man says". And it was not much that they had to dig in when they felt wet sand and a few inches more- it was water!!! Water the picnickers required so much.

But few among this picnicker- lot pondered on : if water is such a scarce commodity even in a post monsoon month, how would it be in the peak of summer!!! It felt weird to hit upon a place so close by and yet so dry and so different from their own ! They decided to find out some more from the old man. These few included a couple of school teachers and a journalist who decided to learn more about the perils of the people of the area.

"Did you get water then?" asked the old man as they approached him.

"Hanspahari is as wretched as most of other Bankura villages of Dhanshimul, Kendbani, Beriathole.... (forest-bound tribal villages on uneven landscape with limitless poverty). Every one toils to put together a square meal. In early rains they sow the small lands they have and leave in search of jobs as wage labourers. Children & aged people stay back in the villages, waiting eagerly for their return.

The migrants get back after two or three months- with some hard cash in their hands- only to last them another few more days. If rainfall is good, their own land yields some food. If rain fails, severe shortage of food occurs. Families have to mortgage their land, sell their utensils or animals, borrow food or money at high interest rates and may be migrate eastwards again in search of work. The resort is pawning lands or some bits of household articles that's left with the money lender or migration again...!

"Such is the subhuman life that we live here"- cries the old man. "But look there- we have forests, we have land— and the will to put in hard labour- the only thing missing is WATER!!!

"But can't you make some arrangements for water?"

"Possible, it is definitely possible. All the rains flow down those slopes into the valley here- we could have stored this water if we had erected some bund around. The stored up water would have solved the water problem to a large extent," yells out some one in the bare torso crowd that has gathered by now around the old man and the young picnickers.

"Then why don't you!!!"

"How to- what do we have except the labour that we can put in?"

It was getting dark and the picnickers had to leave. They left with this nagging water problem on their mind.

But they went back again. Time and again. They sat with the villagers. It was decided that people from these four villages would put in labor to raise a bund for harvesting rain water. But still they would need about Rs. 80-90,000/-. They approached various government offices- the Block office and the Irrigation department offices. Irrigation department pooh-poohed them saying it would require at least five to seven lakhs to construct a water harvesting structure- and even if it is done it would not serve the purpose- they wouldn't get water. The Block Development Officer flatly said there wasn't that kind of money available.

After a lot of running around from pillar to posts, Ram Mohan Chattopadhyay, one of the youngsters met eminent Social Worker Sri Pannalal Dasgupta. He visited the area and arranged for a sum of Rs 80,000/- for the work.

The work started and despite a few resistances from the government departments, the work went on with the zeal of the villagers. There was further need for fund as the work was getting finished. That money was also arranged with help from Pannalal babu. It took almost one and a half years, starting at the beginning of 1981 and finishing in June of 1982. The total expenditure was One lakh and six thousand rupees.

It was good rain in the first year itself. The reservoir was full! Channels were improvised along the natural contour of the land for distributing this water.

This reservoir now provided water to 100 acres of land in the rainy months and to about 50 acres in winter. Drinking water was now available year round and people could even culture Fishes in the reservoir!!! Every one now got water paying a water tax. The fish sale proceeds went into a common fund that was used for the repair and maintenance of the reservoir. Villagers now say that previous soil run off has reduced a great deal now and the grasses that grow on the bund serves as fodder.



photo : Abhijit Das, DRCSC

The pond of Hanspahari after 15 years. Water never dry up even in summer season. People grow rice plant seedling using excess water from the pond. (Jan, 1997)

This true story was not just to narrate a success story. This story depicts the possibility of an alternative water conservation system with people's science and that's based on the true demand of the people. This story tells us that water and livelihood securities are synonymous. Isn't it astonishing that such a village we saw just now is only 20 kilometers away from a big Dam, likes of which has been portrayed in our Geography text books as the 'Temple of Modern India"! Performance of one such big dam close to this village in our story is declining day by day; but efficacy of 'Hanspahari Jorh Bund', the water conservation structure that these villagers in Gangajal Ghati Block erected is still sustaining.

There is enough water in our state but paradoxically there is also acute water scarcity! It does rain a lot in our state. The district which receives least rainfall is Purulia. But even the total rainfall here is double the rainfall that half of the areas in our country receive!!! But amount of rainfall doesn't ensure water! This is evident by the fact that Purulia or neighboring district Bankura have recurrent droughts!

We have failed to conserve this huge amount of rain water we receive. On one side there is drought and flood on the other- people live with it. And now we have water remaining stagnant for at least a month after a mere 10 days of rainfall. Problem of another dimension this! We have seen such a thing happening in North 24 Parganas in the year 2000.

Water demand increases with population increase- we know this. But per capita water availability is decreasing rapidly in this state as the demand goes up. Per capita water availability of 5608 Cu. Meter in the fifties has now declined to 1839 Cu. Meter in 2001(almost $\frac{1}{3}$ rd)

Inequities in water distribution have also become acute. A middle class citizen in Kolkata uses 300 litres a day. Average distance that a villager in the tribal belt of Purulia has to walk every day to fetch drinking water is a stretch of 3 kilometers (Anandabazar 10/04/2002).

We have altered our agriculture in the post independence era to meet the food demand. The Boro crop of paddy requires three times more water today than the Aush varieties of paddy of the yesteryears. This water is being provided by Cross bunding the rivers and by extracting ground water. Over-extraction of ground water has made about 2 crore people vulnerable to Arsenic pollution. About three lakhs more people are suffering due to Fluoride contamination.

'According to my calculation- we could have stored up the entire water mass of the flood of 2000 had we used only a third of our agricultural land' says eminent river expert Kalyan Rudra. It is possible to store that amount of water upto a depth of 10 meters in an area of 1175 square kilometer. Why can't we preserve this surface water? Unplanned urbanization and industrialization, river planning, settlement on the river beds, deforestation are some of the major reasons. All these are contributing to silting of our river drainage system. The big dams have reduced the water flow which is adding to the siltation rate of the rivers too.

Apart from all these, the rivers, canals and other water bodies are also drying up, partly because of natural reasons and more often, due to various human actions too. The water that we draw with the deep tube wells used to keep these water bodies alive during the drier seasons. Many water bodies are also being filled up due to unplanned housing projects and other construction activities.

Flood every year results from the destruction of these water harvesting structures. On the other hand in dry months there are droughts and tremendous water scarcity. But if the flowing surface water can be conserved then the three problems, i.e. control of flood, drought and arsenic pollution, can be tackled.

Water harvesting can be done in urban areas like Kolkata too. Researchers in the School of Environmental Studies have worked out that if the rain water that falls on the roof tops of Kolkata could be stored that would provide for five months of water requirement- which also means for five months there wouldn't be any need for withdrawal of ground water.



photo : Abhijit Das, DRCS

An example of one of village pond.

Local people can also access this pond equally for all purposes. This kind of pond is called 'complete (like a coin of one rupee) pond'.

Let's get back to the issue of water conservation we started with. A survey made by the West Bengal Government in the seventies had shown that there are about 11 lakhs big tanks in the state, leaving aside the numerous more smaller ponds and embankments. It shows the culture of water conservation that evolved in this state through the ages. Isn't this synergy of people's science, technology, social dynamics and folk culture that led to this system of water conservation wonderful!

Let's have a couple of examples of the above. An old adage advises to have ducks in the east and bamboo grove on the west- meaning there should be a pond in the east and a grove in the west. There used to be instructions as to what kind of plants are to be there around the pond too- ponds surrounded by palmyra trees! Or this- Drawing shadowy hood on the face/ remains our neighborhood/ a tank right in the middle/ with palmyra groves around! It advises to plant a multipurpose tree like palmyra and not a plant that would obstruct sun rays falling on the water surface to ensure the health of the food web of the pond.

Ponds used to be treated as goddesses. Almanacs indicate a good time for excavation of a pond even today. This goddess is our household belle though! Even today, ponds are married off!!! A pole or a small temple in the middle of a pond indicate the marital status of a pond! Mothers in the olden times used to observe a ritual (PUNNI PUKUR) in the summer month praying for a good rain that would refill the pond!

Ponds used to be treated as the receptacle of life. After excavation ponds used to be given 'Life'. This used to be the task of the 'Mudi' community rather than the Brahmins, the usual trustees of the village rituals. The 'Mudi' community used to identify the right place for digging a pond and was also apt at digging one too. The Santals, Mundas and the Shabars of the Bengal plateau were also skilled in site identification and excavation of ponds. They knew the technology of selecting a site that would have a recharge conduit for the pond from the sub-surface aquifer. It is a common belief in Purulia that the famous Saheb Bund has a river flowing below as this tank retains water year round even in the drought months.

There used to be village funds for maintenance of the tank. Farmers used to take out the silt



photo : Abhijit Das, DRCS

Ponds also get married and gets puja (pray)....

Small mountain in the middle of the pond suggests that this pond is already married. Small temples or wood log can also symbolize the marriage of the pond.

Mothers of the village offer pond special puja in middle of June-July, before rainy season starts. This puja is called 'Jam Pukurer Brata' which means 'saving pond from death'. Mothers pray god for plenty of rain water-stock for their community pond.

These customs & cultures related to ponds have already disappeared in most urban areas & even in parts of rural areas.

Actually we can understand how Bengali people & its culture have deep relationship with water bodies through Bengali language. Bengali has 6 vocabulary describing water bodies, Jhil (very big natural pond), Dighi (big pond), Pukur (pond), Dho (small pond), Dhoba (smaller pond) & Garha (smallest pond)

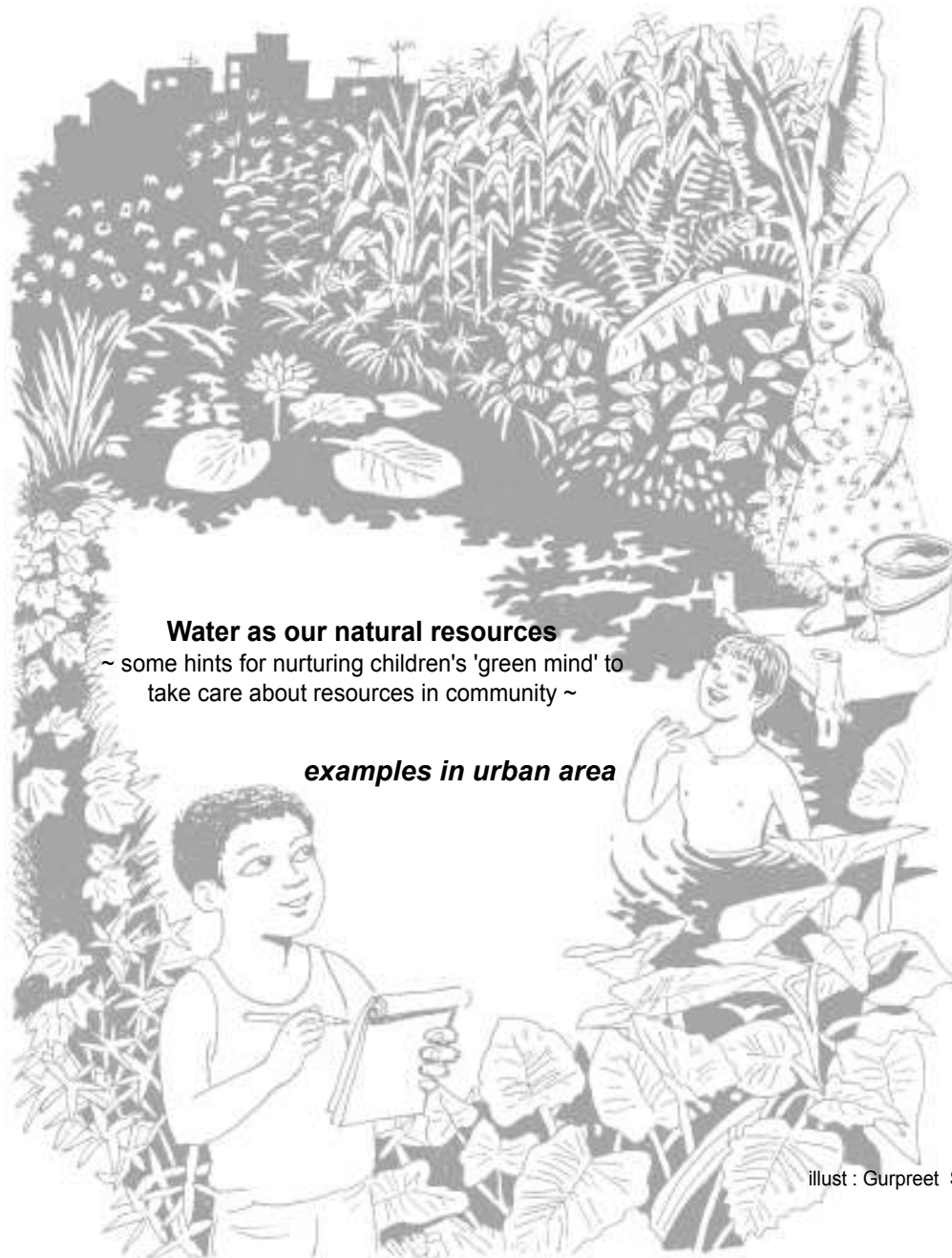
before monsoon and used to apply it in their fields. Potters used to make clay idols from this silt too. The silt used to be handy for house repair jobs. Everybody making use of the pond for profit used to pay a part of the profit to the village fund. Still today there are villages where one finds 'Solo Anna Pond'- meaning everybody in the village used to have right to the pond and every one used to be associated with the maintenance of the pond. Such cooperative institution for the welfare of the commons is a rare commodity these days.

The village zamindars, local chieftains also used to excavate tanks to mark various occasions of celebrations or as memorials and also in their effort to be remembered by the people; for they knew that people would keep these tanks alive for their own benefits.

Thus became enriched this relationship between life and water through the ages- histories of traditional conservation made. Rabin Mandal from North 24 Parganas has narrated the history, geographical feature of the pond of his village in the 'Water' issue of 'BasBhumi'. He has also described the usefulness of ponds in water conservation. We can also do such studies. We have take up this task upon ourselves to conserve water. We have to learn not to ignore the value of water and to respect the value of it. We have to do this for our own life! There was not so much negligence and ignorance about the conservation of ponds and tanks even 30-40 years back. The downfall started as our planners leaned towards the western models and shut their eyes on our own culture. The 'Modern' water system that was created by bunding the rivers has started to take our lives instead of providing for it. Yet the multipurpose pond that Rabin talks about in his study continues to support life and is as efficient today as it was 150 years back. How can we ignore it!

[source : 'Chasher Katha' vol. 7 no. 2 - 2002, 'Lokapatrika - Banglar Dighi']

Subrata Kundu holds the position of the Secretary in Development Research Communication & Services Centre. He is associated with the editing and compiling of some newsletters and journals of the centre itself and outside. Although he is closely associated with the compiling of documents on sustainable development, his main area of interest lies in natural resource, social science, environment & human culture.



Water as our natural resources

~ some hints for nurturing children's 'green mind' to take care about resources in community ~

examples in urban area

illustr : Gurpreet Sidhu

Though in ENRE project we can not yet extend our activity in urban area, there are already some groups and organizations working for better environment in Kolkata (Calcutta). Here we introduce one of the efforts for saving a large pond in southern Kolkata by the citizen's group called "Jheel Sanrakshan Committee" and an environmental group 'Vasundhara'. We can learn from their experience how to create a movement of community based water resource management, including children's participation.

Story of Renovating a Waterbody

— as a case study how community based effort can save the waterbody in city —

by ENRE team
(based on discussions
with Sri Mohit Ray)

There is a very large pond (about 2.46 acre) in Jadavpur, southern Kolkata.*¹ Before the situation of this pond was not so good. Water was rather polluted, a lot of wastes on the banks, some houses were located illegally on the banks, and water level was decreasing constantly.

Vasundhara – a Kolkata based environmental group has been involved in local issues for last few years. A few local people, who realized the need of some environmental protection to save this local water body, themselves started the cleaning up this large pond. They appealed to the community's people on the issue, organizing meetings and formed a community group named "Jheel Sanrakshan Samity". Vasundhara's leading persons were a part of this community move. Vasundhara published environmental surveys of the water body involving students belonging to four different local schools (altogether about 400 students, class 8-10) in their area.*² Vasundhara helped Jheel Sanrakshan Samity to organise workshops on improvement and renovation of the waterbodies bringing academics and activists together. A lot of children & students joined their campaign rally for increasing awareness among inhabitants, too.

The renovation effort required strong community participation. People from all walks of life helped the movement. Ultimately the pond was renovated with the help of Kolkata Municipal Corporation and Government of West Bengal with active participation of local community. After one year 15 households who illegally settled along the sides of the pond agreed to shift to nearby land which the government prepared for them. The houses were rebuilt with the money collected from the local people. Vasundhara has published a day-to-day account of this exemplary community movement. It has also produced a slide show with the past photographs of the pond and the new ones along with the photos of the movement.



photo : Vasundhara

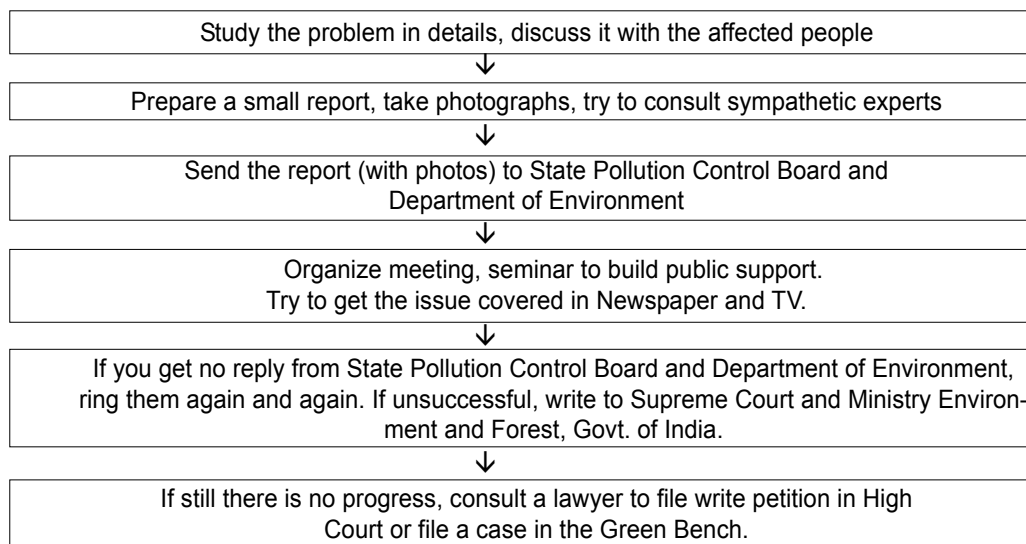
Since then the responsibility of this pond has been totally in the community's hands. The banks of the pond is now so nice that different cultural groups organise programme here. They have already planted many trees around the pond with help from the community. Presently the management cost of this pond is covered by Fish culture, for children, and 'tax' for immersion of Goddess idols in the time of Durga & Kali puja. This 'tax' is for cleaning and removing the remaining materials of idols from the pond (about Rs.300 per idol of Durga made by community clubs, less price for Kali because of smaller size of idols. Rs.10 for idols of family puja. In Each Puja time more than 50 idols are immersed.!) This system provides good income for community management. People are also happy because they don't need to spend a lot of money & time to carry their idols to Ganga river !



As commonly observed in any town, can we see any plastic bag- wastes etc. surrounding the pond ? 'No, not at all.' One of the community's member proudly tells us 'The people's awareness has grown so much , specially among children, people think this lake is 'ours' and nobody throws in their trash'. With cooperation from local artists , children painted and drew pictures on the walls surrounding the pond. People take baths at a common ghat. (but washing clothes and dishes are not allowed). People enjoy evening walks along the pond.

'Vasundhara' with Jheel Sanrakshan Samity organize people's get-together at this pond 2-3 times a year observing Wetland Day, Painting Camp, Health Camp etc.

They suggest in their report what steps can be taken for saving water body or in case of environmental problem in our locality.

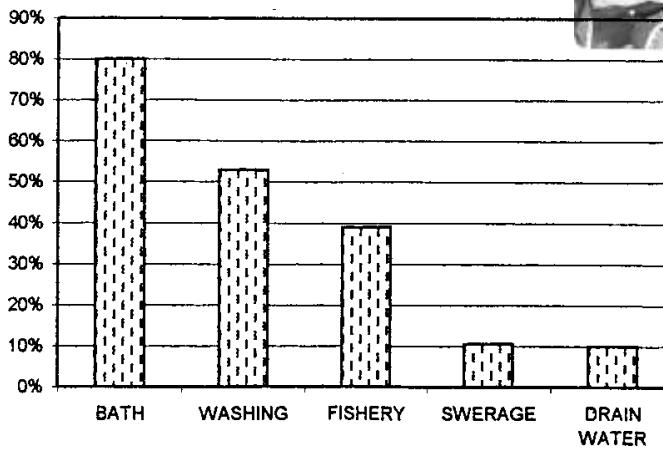


*1 This city of Kolkata still has about 3000 ponds strewn across its 141 wards.
 ("Vasundhara Annual Survey of Environment, Kolkata 2002")

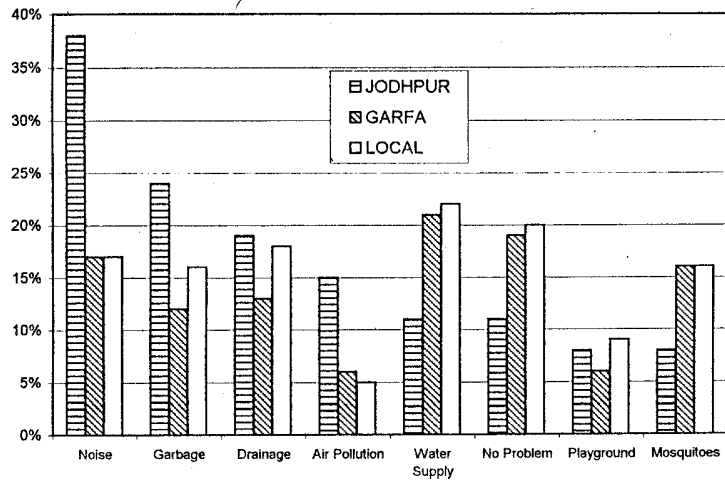
*2 Some results of Environmental Survey conducted by students (Source :
 'Environment of East Jadavpur' – as seen by the students, A Survey Report, Vasundhara)



Uses of pond



Priority in environmental problem



For further detail and information, please contact to

Vasundhara (contact person Mr. Mohit Ray)
 10 Second Road, Eastern Park, Santoshpur, Kolkata – 700075
 Ph: 2416 1534 e-mail : mrsng@vsnl.com



References

To develop lesson plans on WATER we have looked through the following resources. If you are interested in to see these materials, all resources listed here are available through ENRE resource centre EEL (Environment Education Library). EEL also stores topic related articles from several magazines and news clippings. Please inquirer us.

Books and Booklets on WATER :

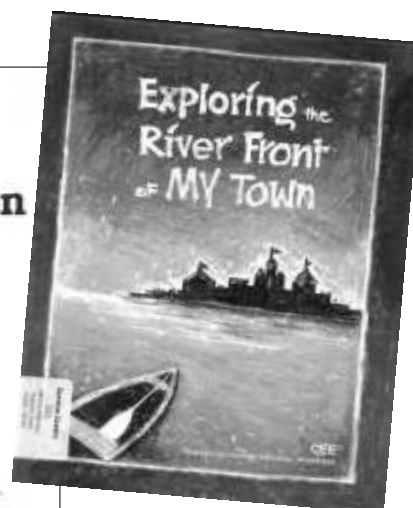
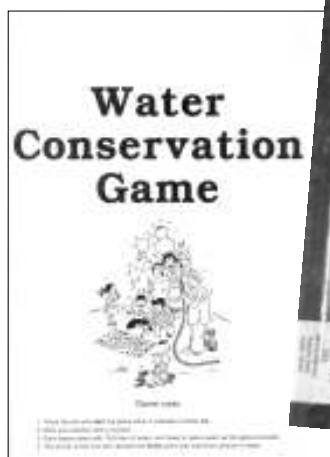
For your convenient we put some categories.

Category (A) useful for producing materials, (B) useful for teachers & (C) materials for children.

_ recommended materials for Environmental Education

P recommended for school library

- Land And Water – Book4 / School's Environment Network/ 1993, 24p. (A) (B) (C)
- Pollution – Book 9/ School's Environment Network/ 1993, 24p. (A) (B) (C)
- Water Management Traditions In India / Uma Shankari et al, 1993, PPST Foundation, 113p.; (A)
- Create An Oasis with Grey Water / Art Ludwig, 1994, Oasis Design, 47p. ; (A)
- AQUA TERRA : Water Concept for the Ecological society / The Water Centre, 1991, USA, 63p. ; (A)
- Joy of Learning; Standard 3 to 5 (Activity : 7, 8, 9, 38) / 1995, CEE, 87p. ; (A) (B) _
- Joy of Learning; Standard 6 to 8 (Activity : 17, 20, 24, 33, 50) / 1996, CEE, 67p. ;(A) (B) _
- 'Source Water Protection' / Safe drinking water hotline,1997, 2p.; (A)
- 'Water Quality and Health' / Water Resources and Third World Development, 3p.; (A)
- GAIA: An Atlas of Planet Management / Myers Norman, 1984, USA, 272p. (A) (B)
- People's Work Book ('Water' p.p 250-290) /
- 'Water, Sanitation and Hygiene' /Footsteps–No.30, March 1997, TEAR FUND, 20p; (A) (B)
- 'Water' / Footsteps – N0. 51, June 2002, TEAR FUND, 20p. ; (A) (B)
- Child to Child Reader : ATTACK / Voluntary Health Association of India, 1990, 16p.(A) (B) (C) P
- Helping Health Worker Learn / David Werner, 1982, USA ; (A)
- WATER: A Project Outline/ Madhuban Educational Books, 1991, 35p. (A) (B) (C)
- 'Pollution- Water Pollution' ('Green Minds' pp 37-43) /ATREE (A) (B) _
- Water Conservation Game





- (Chart) / Alice Varkery et. al , Nehru Foundation for Development; (A)(B)(C) _
- Water Fit to Use / Carl Walter Carlson et.al, 1966, the Jhon Day Company, 127p. ; (A)
 - Water ; Save Some for Us (Educational Package)/ CEE, fact cards & posters; (A) (B) (C) _
 - Conserving Our Water Resources: A Handbook EE Activities for Teachers 5 to 8/ CEE, 1988, 60p. (A) (B) _
 - Exploring the River Front of My Town/ Feisal ALKAI, CEE, 94p. (A) (B) (C) _P
 - Traditional Water Harvesting Systems / CEE, 28p. (A)(B)
 - Our Water Our Life / Arvind Patwardhan, 1992, NOC BJG VJ, 32p.
 - Water Quality Monitoring in School / Bala Subramanian, 1992, CEE, 38p. (A) (B) (C) _P
 - 'Water Reflection' ("Living Lightly on the Planet: Unit 3 Vol1, Grades7-9")/ Maura O'connor, 1985, (A)(B)
 - 'What about Water'("Living Lightly on the Planet: Unit 2 Vol2, Grades10-12")/ Maura O'connor, 1985, (A)(B)
 - 'Special Issue on Arsenic Contamination in Ground Water of West Bengal, ("DEBACLE Apr-Sep. 2001") / DRCS (A)(B)
 - CATCH WATER : The CSE Campaign for People's Water Management/ bi-monthly newsletter, CSE (A)(B)
 - Source Bulletin: Water and Sanitation news review /monthly newsletter ,WSSCC-IRC 8p. (A)
 - The Good Society : The Pani Panchayat Model of Sustainable Water Management (An INTACH Series-7) / G. Pangare & V. Lokur, 1996, INTACH , 85p. (A)
 - A Survey Report 'Environment of East Jadavpur : as seen by the students'/Vasundhara, 1997,20p. (A) (B) (C)

Bengali Books

- Amar Bandhu (page 3.3, 3.4, 6.3, 6.8) / CCRC-Sahay, 1993 (A) (B)
- Paniya Jal Sodhon / DRCS, 1994 (A) (B)
- Jhil Road-er Sesh Jhil – Benche Othar Dinalipi / Basundhara (A) (B)



Interesting Lesson Plans on WATER

You can find out a lot of Web sites on Environmental Education and related activities. The following are the examples of some useful lesson plans. You can directly access to each web site or contact us for the detail.

Lesson plans	Level	Web site
A Project on Water	primary	www.project-approach.com
Water Science for School	upper-primary	http://ga.water.usgs.gov/edu/waterproperties.html
Water ; Publication available from other source	primary	http://pa.lwv.org/wren/pubs/publist.html
Global Rivers; Environment Education Network	for teachers	www.igc.apc.org:80/green/greeninfo.html
River Stories	for teachers	-----do-----
Lesson ; the Water Cycle	upper- primary	http://faldo.atmos.uiuc.edu:80/w_unit/LESSONS/water.cycle.html
Community Links for Sustainable Healthcare	for teachers	(paper available in EEL)
Env. Education Curricula	primary	http://rdservl.rd.msu.edu/enved/curric/index
Environmental Pollution	middle	http://school.discovery.com
Drinking Water for Kids	primary to secondary	www.epa.gov/safewater/kids/exper.html
Take Action Water	upper primary	www.wre.govt.nz
Waterwise Water Usage Survey	primary	www.schools.ash.org.au/peace/sose.htm



ENRE Partner Organisations' Contact Address

- **Swanirvar**
(contact person : Mr. Samir Biswas)
Andharmanik, Baduria,
North 24 Parganas - 743401
West Bengal
- **Phulbari Grameen Bikash Kendra**
(contact person : Mr. Torun Kanti Bera)
Phulbari, Sagarphulbari,
Rudranagar, Sagardeep,
South 24 Parganas
West Bengal
- **Ashurali Gram Unnayan Parishad**
(contact person : Ms. Modhumita Ata)
Asurali, Sadhur hat,
South 24 Parganas - 743504
West Bengal
- **Vikramshila Education Resource Centre**
(contact person : Mr. Atanu Sain)
77 Maharaja Tagore Road
Dhakuria, Kolkata - 700031
West Bengal
- **Kajla Janakalyan Samity**
(contact person : Mr. Vivekananda Sahu)
Sarada, Contai
Midnapur - 721427
West Bengal
- **Gandhi Vichar Parishad**
(contact person : Mr. Kalyan Roy)
Sahay NC-18, Schooldanga
Bankura - 722101
West Bengal





From ENRE

- Forthcoming issue of 'Creative lesson plan - Basbhumii series' are
 - 4) Medicinal Plants, 5) Birds, 6) Energy (Fuel), 7) Fish, 8) Rice culture, 9) Waste,
 - 10) Vegetables, 11) Local market, 12) Community development work / NGO work

Please send back the 'feedback slip' alongwith your comment and suggestion on this booklet 'Water' to us. We will put your name on our mailing list and send you a free copy of the next booklet on 'Medicinal Plants' for your reference!

- Water related publication from DRCSC. If you have interest & want to get copies, please contact us.



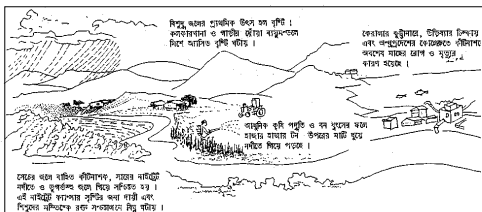
'DEBACLE : Apr - Sep 2001' (English, 70 pgs, Rs. 10)
A Special issue on Arsenic contamination in ground water of West Bengal, intervention possibilities and mitigation initiatives



'Ecological Vision : Exploring Alternatives for Co-evolution' (English, 2002, 176 pgs, Rs. 100)
included chapter on 'Water ! Water !' — a selection of observations through the ages and abuse of this most basic life-supporting resource.
'Arsenic in the water...run...run...run...'
News-items containing the debate around the findings of non-acceptable levels of arsenic in drinking water.



'Chasher Katha : Jul - Oct 1999' (Bengali, 46 pgs, Rs. 5)
Bengali magazine on sustainable agriculture included an article on water resources & its privatization



'Jal' (Bengali, 1994, 12 pgs, Rs. 7)
a bengali booklet introducing water issue with simple text & illustration.



MEMO PAGE



Feedback Slip

Water

If you would like to be included on 'Basbhum Series' mailing list and receive forthcoming Creative Lesson Plans booklet then please fill up this slip and return it, in the envelope address to :

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58A, Dharmatola Road, Bosepukur
Kasba, Calcutta-700 042
West Bengal, India

[OR you can send the
same content by email
enre_sc@vsnl.net]

Thank you for your cooperation.

- Your name or contact person of your organisation

Name: _____ (Mr.) (Ms.)

Position: _____

Name of Institute: _____

Address: _____

Phone: _____ E-mail: _____

- You are going to use this Creative Lesson Plan booklet

as a teacher educator community workers
 parents others

- In relation with your work & interest, you find out this booklet is

useful not so useful unsatisfied

because _____

- Are you going to apply lesson plans in booklet in your teaching work or in some other way

Yes, I'll try all steps some part of lesson plan no

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- Among the topics of forthcoming booklets which topic are you interested in ?
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- 6. Energy 7. Fish 8. Rice 9. Waste 10. Vegetables
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- Your contribution, if possible

- Exchange EE materials / booklet
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- Others (donation, volunteer, sending your own lesson plans etc)

- Your comments / suggestions

- Do you want to place order 'Bashbhumi Series no. 3 - Creative Lesson plans on WATER'?
(10% discount offered for more than 10 copies ordered, booklet no. 1 & 2 also available,
please state English / Bengali)

Yes _____ Copies No

Date _____

Signature