

**Project: ANTINOMOS**  
**Report on Indigenous Technologies**

**Case No: 6**

**Step 1 – Description**

- 1. Name of Technology to be evaluated:** Lime treated Drinking Water
- 2. Location where technology is being evaluated:** Parwada and Gorimja (Jamnagar).
- 3. Number of people approximately being served by the technology:** 1200
- 4. Since when it is in operation?** It is an ancient technology.
- 5. Who Designed / Planned and who implemented / constructed the technology?**  
: Mr. Sureshbhai Ghanshyambhai Sidhpura and Mr. Dalipbhai Desai (Parwada) and  
Mr. Veerjangbhai Jethabhai Manak and Mr. Jaidevbhai Kera (Gorimja).
- 6. Who is taking care of the technology now?** Owner of the tank.
- 7. Are there any standards available which need to be fulfilled by the technology?**  
**If yes which?** Drinking water.
- 8. Are operations and maintenance data records available?** No.
- 9. Please provide a brief summary of the history/evolution of this technology in the selected case study:**

It may be a matter of wonder for many that the water of rainy season could last for the summer of next year for drinking purpose when the water stored from the bore well for even a week is no longer potable. But it is very much practiced in many Indian villages. This indigenous technology dates back many hundreds years ago when people used to do water harvesting for their needs by digging underground tanks, wells, *bawari*, etc. Lime too was used by them for water treatment. Earlier, people used earthen pots filled with lime and cover their mouths with a piece of cloth. They then used to put the earthen pots in tank and lime, in this way, used to leach out slowly and thus purify the water. The method adopted today by some people is that they put 3-4 packets of lime weighing 1-2 kilogram each depending upon the size of underground tank. These packets are lightly pierced so that lime leaches out slowly from them. These packets may be replaced by fresher ones for more effectiveness and sometimes chlorine too is used for the same.

**Brief technical description of technology:**

The current method through which water treatment is done is:

As shown in the Fig.1, the roof area is thoroughly cleaned up. In places where the roof slope is lined with open pipes, slightly slanted to carry the water from the rains on the roof into a small square cistern. This cistern is so made that the dirt in the rainwater gets settled here and then the additional water is allowed to flow into a bigger underground tank. The size of tank depends upon the family requirement as well as the quantity of rain in that area.

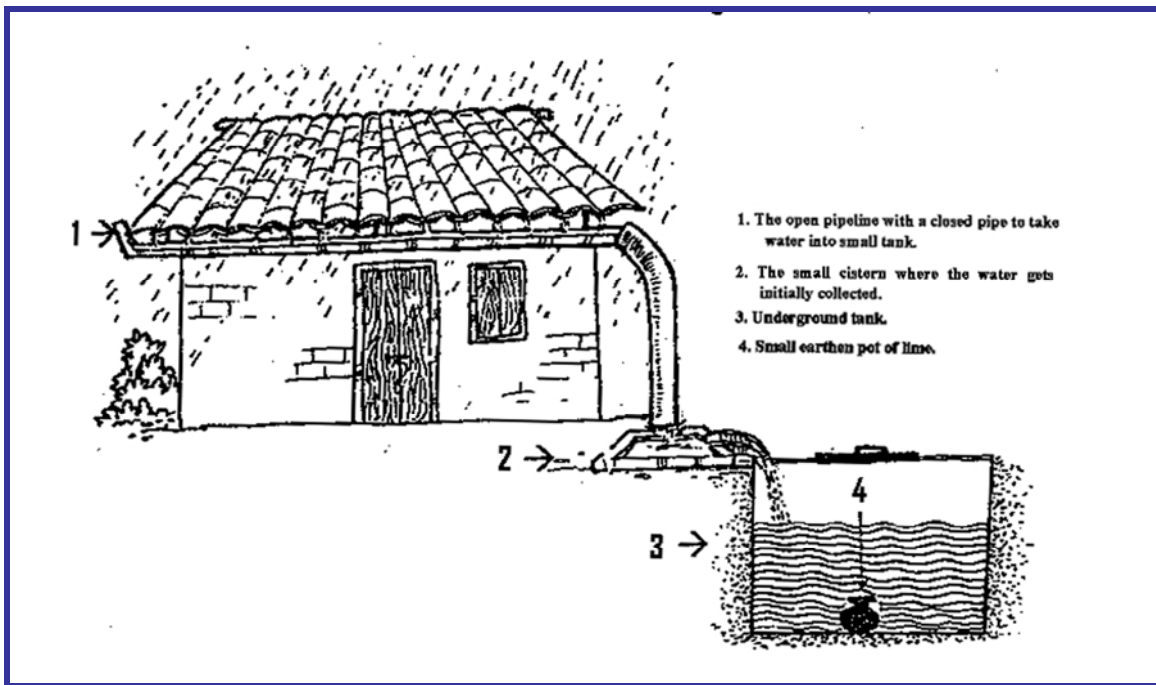


Fig 1. Sketch of lime treated drinking water storage method.

(In Fig.1, number 1 show open pipeline with a closed pipe to take water into small tank; 2 shows the small cistern where the water gets collected initially; 3 shows the underground tank; and 4 shows small earthen pot of lime). Besides, some initial water is allowed to flow off so that the dirt carried by the first sweep of water does not get into the underground tank. All care is taken to get clean water. This water remains potable for at least first 3 to 4 months.

### **Cleanliness and Consumption:**

Only a clean bucket is used to draw water from the tank. When not in use, the tank is kept closed with an air tight lid. And most of the tanks are fitted with small hand pumps for fetching water so as to prevent the tank water from contamination. Before the first rain arrives, the tank is thoroughly cleaned and its walls are whitewashed. That is why, in earlier times, people used lime in case the tank water is contaminated and began to reuse the water after three days. Due to this earthen pot of lime kept at the base of tank, the rain water remains clean up to 6 to 8 months and can be used both by people and cattle for drinking purpose. Since the pot, covered with a piece of cloth, is made of clay so due to its properties the lime keeps leaching out of pot in a very uniform manner slowly out in the water and keeps the water potable and disease free even if more water is added regularly. Now of course after being emptied, the tank is filled up with sweet water from tankers. This has put an end to the burden of collecting water every day and provides with enough free time to indulge in other productive activities.



## Step 2 – Evaluation

**Date of visit:** December 21<sup>st</sup> to December 28<sup>th</sup>, 2008.

**Name of the expert(s) making the visit:** Dr Suboodh Kumar Bishnoi

**1. Preliminary performance indicators for accessing whether the intended direct benefits have been fulfilled:**




<b>Intended Benefit</b>	<b>Indicator</b>	<b>Method of Verification</b>
Drinking water		
Technical functioning	Performance in last 10-15 years	Experts visit
Acceptance by local community		



<b>Unintended Benefit</b>	<b>Indicator</b>	<b>Method of verification</b>
Family health improvement	Less water borne diseases	
Ecologically beneficial as ground water level has come up		

**2. Results of Assessment:**

<b>Intended Benefit</b>	<b>Indicator</b>	<b>Fulfilled Yes/no</b>	<b>Comments (with reference to the used indicators)</b>
Drinking water		Yes	
Technical functioning	Yes		System is working extremely well
Acceptance by the local community	Yes		Users are mainly satisfied with the system and consider it a success.
Water conservation		Yes	

**Comments from the local peoples:**


User Group	Results/ Comments
<p>1. Mr. Sureshbhai Ghanshyambhai Sidhpura (26 Years),</p>  <p>Village-Parwada, Distt.-Jamnagar.</p>	<p>It is a beneficial technology which caters to our drinking water requirements We do not have the extremely expensive machines in vogue today for treating drinking water. So you could call it a poor man's way of treating drinking water and removing impurities and contaminations from it. We are satisfied with the results till now as we have been using this method since we our self were children.</p>
<p>2. Mr. Dalipbhai Desai (46 Years)</p>  <p>Village-Parwada, Distt.-Jamnagar.</p>	<p>This traditional water harvesting system and water treatment method is an excellent technology as it provides us with good quality hygienic water compared to the other sources which are getting more and more polluted due to industrial and other types of pollution, etc.</p>
<p>3. Mrs. Manuben Chhagani (47 years)</p>  <p>Village-Parwada, Distt.-Junagarh.</p>	<p>This is a cheaper as well as better way to store drinking water in a hygienic manner. It fulfills our household requirements very effectively. There is lesser risk of water-borne diseases particularly for our children who are more susceptible to them.</p>
<p>4. Mr. Veerjangbhai Jethabhai Manak (45 Years)</p> <p>Village-Gorimja, Taluka.-Dawarika Distt.- Jamnagar.</p>	<p>This is a very beneficial technology providing us good quality water during the water scarcity period. The storage capacity can increase according to the family requirements as in that case a bigger tank can be constructed. Only care should be taken to keep it properly cleaned and not to let impure water enter the tank. Besides, this way traditional water harvesting structures too are getting built more and more.</p>
<p>5. Mr. Jaidevbhai</p>	<p>This is a very useful technique. The best part is it is very</p>



<p>Kera (54 Years)</p>  <p>Village-Gorimja, Taluka.-Dawarika Distt.- Jamnagar.</p>	<p>easy to maintain also. We only have to take care that our roof-tops remain clean and we can get hygienic water for us and our family members.</p>
<p>6. Mr. Maheshbhai Bhikabhai Patel (40 years).</p>  <p>Village-Gorimja, Taluka.-Dawarika Distt.- Jamnagar.</p>	<p>We are very satisfied with this technology. It provides us with quite good quality water. We avoid storing the water of the very first rain of the season because the water is not usable from drinking point of view. In case of our kids getting sick, we start boiling the water before using it. Otherwise, it is fit to drink.</p>

### Summary of User Perceptions

Both Individual Interviews and group Discussions


### Questions (Q):


S. No.	User Name	Questions	Results/ Comments
1.	<p>Mr. Sureshbhai Ghanshyambhai Sidhpura (26 Years),</p>  <p>Village-Parwada, Distt.-Jamnagar.</p>	<p><b>Q1: Are You Happy with the technology? IF Yes why, if no why not?</b></p> <p><b>Q2: Are you using the technology (regularly)?</b></p> <p><b>Q3: Is there anything which may prevent you from using the technology (regularly), if yes what?</b></p> <p><b>Q4: Is there anything which you may not like with the technology or which could be improved (if yes, what and how)?</b></p> <p><b>Q5: Do you have equal access?</b></p>	<p>It is a beneficial technology which caters to our drinking water requirements We do not have the extremely expensive machines in vogue today for treating drinking water. So you could call it a poor man's way of treating drinking water and removing impurities and contaminations from it. We are satisfied with the results till now as we have been using this method since we our self were children.</p> <p>Yes</p> <p>No</p> <p>Care should be taken to avoid the water of initial rains of the season as it is not fit to consume.</p> <p>Basically, it is a personal tank for each family attached with their own houses.</p>

		<b>Q6: Are you aware of any misuse of the service?</b>	No
2.	<p>Mr. Dalipbhai Desai (46 Years)</p>  <p>Village-Parwada, Distt.-Jamnagar.</p>	<b>Q1: Are You Happy with the technology? IF Yes why, if no why not?</b>	This traditional water harvesting system and water treatment method is an excellent technology as it provides us with good quality hygienic water compared to the other sources which are getting more and more polluted due to industrial and other types of pollution, etc.
		<b>Q2: Are you using the technology (regularly)?</b>	Yes
		<b>Q3: Is there anything which may prevent you from using the technology (regularly), if yes what?</b>	No
		<b>Q4: Is there anything which you may not like with the technology or which could be improved (if yes, what and how)?</b>	Proper care should be taken to keep the roof top and underground tank clean.
		<b>Q5: Do you have equal access?</b>	Each family has its own.
		<b>Q6: Are you aware of any misuse of the service?</b>	No
3.	<p>Mrs. Manuben Chhagani ( 47 years)</p>  <p>Village-Parwada, Distt.-Junagarh.</p>	<b>Q1: Are You Happy with the technology? IF Yes why, if no why not?</b>	This is a cheaper as well as better way to store drinking water in a hygienic manner. It fulfills our household requirements very effectively. There is lesser risk of water-



			borne diseases particularly for our children who are more susceptible to them. It is not expensive for a poor family.
		<b>Q2: Are you using the technology (regularly)?</b>	Yes
		<b>Q3: Is there anything which may prevent you from using the technology (regularly), if yes what?</b>	No
		<b>Q4: Is there anything which you may not like with the technology or which could be improved (if yes, what and how)?</b>	No
		<b>Q5: Do you have equal access?</b>	Yes. Every family has got their own.
		<b>Q6: Are you aware of any misuse of the service?</b>	No
4.	Mr. Veerjangbhai Jethabhai Manak (45 Years)  Village-Gorimja, Taluka.-Dawarika Distt.- Jamnagar.	<b>Q1: Are You Happy with the technology? IF Yes why, if no why not?</b>	This is a very beneficial technology providing us good quality water during the water scarcity period. The storage capacity can increase according to the family requirements as in that case a bigger tank can be constructed. Besides, this way traditional water harvesting

			structures too are getting built more and more..
		<b>Q2: Are you using the technology (regularly)?</b>	Yes
		<b>Q3: Is there anything which may prevent you from using the technology (regularly), if yes what?</b>	No
		<b>Q4: Is there anything which you may not like with the technology or which could be improved (if yes, what and how)?</b>	Only care should be taken to keep it properly cleaned and not to let impure water enter the tank.
		<b>Q5: Do you have equal access?</b>	Yes
		<b>Q6: Are you aware of any misuse of the service?</b>	No
5.	<p>Mr. Jaidevbhai Kera (54 Years)</p>  <p>Village-Gorimja, Taluka.-Dawarika Distt.- Jamnagar.</p>	<b>Q1: Are You Happy with the technology? IF Yes why, if no why not?</b>	This is a very useful technique. The best part is it is very easy to maintain also. We only have to take care that our roof-tops remain clean and we can get hygienic water for us and our family members.
		<b>Q2: Are you using the technology (regularly)?</b>	Yes
		<b>Q3: Is there anything which may prevent you from using the technology (regularly), if yes what?</b>	No
		<b>Q4: Is there anything which you</b>	No

		may not like with the technology or which could be improved (if yes, what and how)?	
		Q5: Do you have equal access?	Yes
		Q6: Are you aware of any misuse of the service?	No
6.	<p>Mr. Maheshbhai Bhikabhai Patel (40 years).</p>  <p>Village-Gorimja, Taluka.-Dawarika Distt.- Jamnagar.</p>	<p>Q1: Are You Happy with the technology? IF Yes why, if no why not?</p>	<p>We are very satisfied with this technology. It provides us with quite good quality water. We avoid storing the water of the very first rain of the season because the water is not usable from drinking point of view. In today's time with so many types of pollution, this is an excellent source to remain free of at least water pollution.</p>
		Q2: Are you using the technology (regularly)?	Yes
		Q3: Is there anything which may prevent you from using the technology (regularly), if yes what?	No
		Q4: Is there anything which you may not like with the technology or which could be improved (if yes, what and how)?	In case of our kids getting sick, we start boiling the water before using it. Otherwise, it is fit to drink.
		Q5: Do you have equal access?	Yes
		Q6: Are you aware of any misuse of the service?	No.