Project: ANTINOMOS

Report on Indigenous Technologies

Case No: 5

Step 1 – Description

1. **Name of Technology to be evaluated**: Lateral Virda
2. **Location where technology is being evaluated:** Village-Govindpura, Taluka Veraval, Distt.-Junagarh and Village-Ramnath and Rabade, Taluka- Kalol, Distt.-Panchmahal.
3. **Number of people approximately being served by the technology:** 1200 Govindpura, 2600 Ramnath and 1400 Rabade.
4. **Since when it is in operation?** More then 30 years.
5. **Who Designed / Planned and who implemented / constructed the technology?**

: Mr. Ram RamBhai Devashi (45 Years) Village-Govindpura, Taluka Veraval, Distt.-Junagarh, Mr. Mensibhai Khemabhai Jatewa (45 years) Village-Ramnath, Taluka-Kalol, Distt.-Panchmahal and Mr. Parbatbhai Rajabhai Wala (42 Years), Village-Rabade, Taluka- Kalol, Distt.-Panchmahal.

6. **Who is taking care of the technology now?** By the farmers own.
7. **Are there any standards available which need to be fulfilled by the technology? If yes which?** For Irrigation and Drinking water supply.
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:**

Lateral Virda's are the comparatively recent modification in the form of a lateral hole dug in the existing ancient virda (traditional water harvesting well system). These came into being around thirty years back because in this region due to a hard ground layer below 10-15 feet, it is not feasible to dig a new virda and thus the horizontal extensions. Besides, it also proves its worth as it saves lot of expenses in shifting the electric motor, extension wires, poles, etc. for electric and water supply. Lateral Virda is thus dug in the horizontal direction rather than vertically in the already existing well. Sometimes even up to ten such lateral holes can be dug purely depending upon the water requirement as well as availability of water. The size and the dimensions of the lateral *virda* depend on several factors such as soil properties, requirement, affordability of the

owner etc. The diameter varies between four to six inch and the length can extend up to 300 feet with the direction pointing slightly upwards so that the water can easily come downwards in the lateral virda with the help of gravitational force.

The figure shows the structure of lateral Virda:-

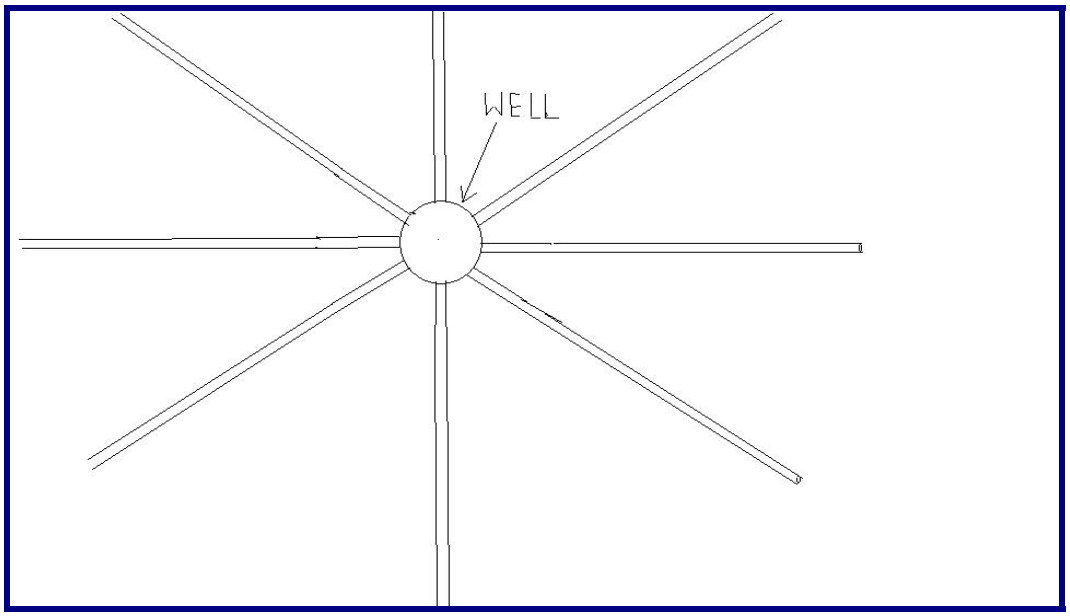

Fig.-1: Top View

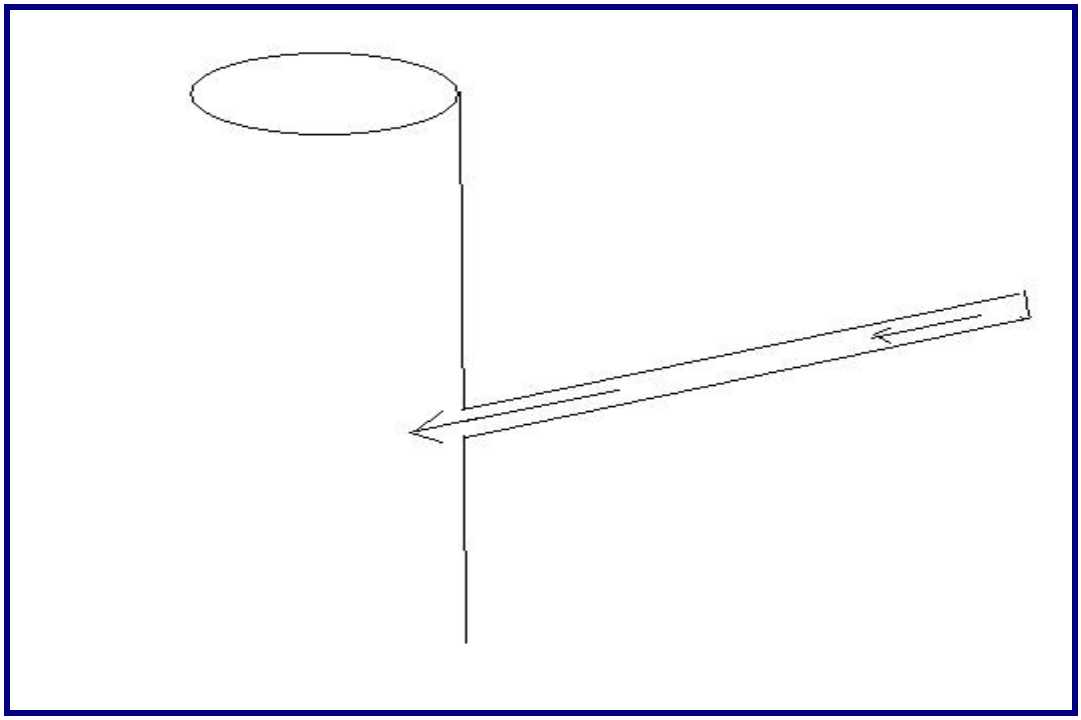

Fig.-2: Sectional View

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

Fig 8

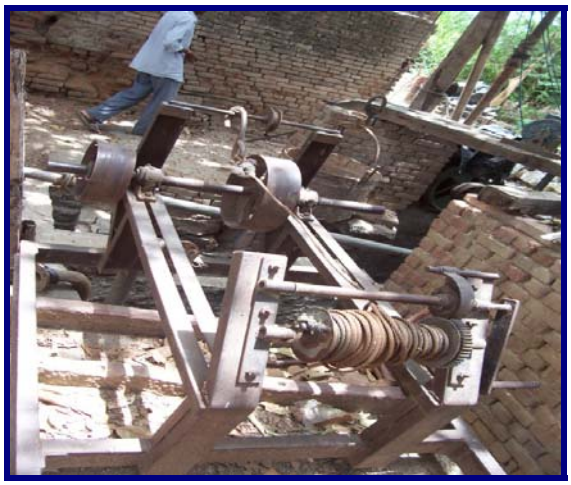

Fig 9

Fig 10

Fig 9

Fig 11

Fig 12


Fig 13 & 14. DTS Compressive Machine

Brief technical description of technology:

The current method through which lateral Virda is done is:

In this method the villagers use to do Lateral Virda or Side boring using the pressure of water. Water is taken from a tank situated on the ground level through plastic pipe (fig 3) and is connected to a 'T' known as '*Handa'* (Fig 4) in local language, which is fitted at the point where side boring is happening in the well. This *Handa* is supported with the help of two '*Sandles*' (Fig 5) which goes deep inside the wall of the well. Through this *Handa*, 5 foot long Iron Pipe known as *'Lane'* (Fig 6) is connected. This Lane has a diameter of 4 inches and at the further most point its diameter is 6 inches, because there it is connected with an Iron Pipe known as '*Paila'* (Fig 7) in local language. This *Paila* is the front most part of the boring or drilling Iron pipes. On the front of *Paila*, iron nails known as *'Loong'* (Fig 8) are fitted, which use to cut down the front stone, in Lateral Virda or Boring is going on. But instead of water pressure acting on stone as was done in earlier times, now a day **AIR PRESSURE** is used, which is generated by the **DTS Compressive Machine**. This is known as DTS compressive machines because it is used to crush or for boring in the Graphite Stone, by generating a high air pressure of 12-14 kg. The figures above show the DTS compressive machine. It helps in cutting the stone. When one entire lane goes completely inside the wall of well, the *Handa* is moved backwards and a new lane is connected to it on one end of the new lane and the other end of the new lane is connected to the lane already inserted in the

wall. Hence like this the process continues up to the required length (300 foot normally) which costs according to Rs.100 per foot. The entire Arrangement on ground is shown in Figures – 9, 10, 11, 12, 13 & 14.

Step 2 – Evaluation

Date of visit: December 21st to December 29th, 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:**

Intended Benefit	**Indicator**	**Method of Verification**
Collection and storage of ground water from a hard ground layer region for drinking and irrigation purposes.		
Technical functioning	Performance in more than last 10 years	Experts visit
Acceptance by local community		

Unintended Benefit	**Indicator**	**Method of verification**
Saving money and labor		Visit
Ecologically beneficial as digging Virda's in many places will waste agriculturally useful land.		

2. Results of Assessment:

Intended Benefit	**Indicator**	**Fulfilled Yes/no**	**Comments (with reference to the used indicators)**
Drinking and irrigation water		Yes	
Technical functioning	Yes		Working properly for the time being but requires due care so that saline water may not start to pour in it..
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**
1. Mr. Ram RamBhai Devashi (45 Years)  Village-Govindpura, Taluka -Veraval, Distt.-Junagarh.	It is a beneficial technology to renew the water supply when it is on the verge of drying up. I got my own well dug around twenty-five years ago. But ten years back, due to lack of water in that well, got a lateral digging done. It is working quite well and I am satisfied with my effort.
2. Mr. Ram Debabhai Vejabhai (60 years) Village-Govindpura, Taluka Veraval, Distt.-Junagarh.	It is an excellent modification of ancient technology as it not only saves money but labor also because it is better to get a lateral virda dug rather than getting another well dug in such a hard soil. I have my own well since the last thirty years. During that time, we had dug the well with our own hands. I got the lateral hole dug ten years ago and got it done through machines.

3. Mr. Mensibhai Khemabhai Jatewa (45 years)  Village-Ramnath, Taluka- Kalol, Distt.-Panchmahal.	This traditional water harvesting structure has proved very beneficial for us. By digging a lateral virda , we do not need to change our existing water and electricity supply set-up . Otherwise, we would have to invest lot more money on electric poles for extension, motor garage, etc. So it saves lot of expenses and thus proves a better and more sensible option too.
4 Mr. Vinodbhai Chhaganbhai Patel (43 years) Village-Ramnath, Taluka- Kalol Distt.-Panchmahal.	Lateral Virda's have been an excellent source of water. I have my own well since the last twenty years but due to scarcity of rainfall during 1999-2003, it became necessary to dig a lateral virda to fulfill the water requirements.
5. Mr. Parbatbhai Rajabhai Wala (42 Years)  Village-Rabade, Taluka- Kalol, Distt.-Panchmahal.	This is a very useful technique. The best part is that in a single bore, we can normally dig 4-6 lateral holes. This number has been found to increase even up to 12 holes in the case of our village.
6. Mr. Maheshbhai Bhikabhai Patel (40 years). Village-Rabade, Taluka-Kalol, Distt. –Panchmahal.	We are very satisfied with this technology. It definitely makes much more sense to dig a lateral hole rather than digging a whole new well in such topography. With the arrival of advance technology in form of motors, it is all the more easily to do so.

Summary of User Perceptions

Both Individual Interviews and group Discussions

Questions (Q):

S. No.	User Name	Questions	Results/ Comments
1.	Mr. Ram RamBhai Devashi (45 Years)  Village-Govindpura, Taluka- Veraval, Distt.-Junagarh.	**Q1: Are You Happy with the technology? IF Yes why, if no why not?**	It is a beneficial technology to renew the water supply when it is on the verge of drying up. I got my own well dug around twenty-five years ago. But ten years back, due to lack of water in that well, got a lateral digging done. It is working quite well and I am satisfied with my effort. Earlier, with good rains it was not necessary but in recent years with the dread of drought looming large, it is an important exercise.
		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)?	No

		Q5: Do you have equal access?	Basically, it is a personal decision to get a lateral hole dug and personal property too.
		Q6: Are you aware of any misuse of the service?	No
2.	Mr. Ram Debabhai Vejabhai (60 Years) Village-Govindpura, Taluka- Veraval, Distt.-Junagarh.	**Q1: Are You Happy with the technology? IF Yes why, if no why not?**	It is an excellent modification of ancient technology as it not only saves money but labor also because it is better to get a lateral virda dug rather than getting another well dug in such a hard soil. I have my own well since the last thirty years. During that time, we had dug the well with our own hands. I got the lateral hole dug ten years ago and got it done through machines.
		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)?	Sometimes, if saline water comes in lateral virda, then it cannot be used and the whole exercise goes waste.
		Q5: Do you have equal access?	Each family has its

			own.
		Q6: Are you aware of any misuse of the service?	No
3.	3. Mr. Mensibhai Khemabhai Jatewa (45 years)  Village-Ramnath, Taluka- Kalol, Distt.-Panchmahal.	**Q1: Are You Happy with the technology? IF Yes why, if no why not?**	This traditional water harvesting structure has proved very beneficial for us. By digging a lateral virda, we do not need to change our existing water and electricity supply set-up . Otherwise, we would have to invest lot more money on electric poles for extension, motor garage, etc. So it saves lot of expenses and thus proves a better and more sensible option too.
		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)?	No
		Q5: Do you have equal access?	Yes. Almost every

			family has got them dug according to their requirements.
		Q6: Are you aware of any misuse of the service?	No
4.	Mr. Vinodbhai Chhaganbhai Patel (43 years) Village-Ramnath, Taluka- Kalol Distt.-Panchmahal.	**Q1: Are You Happy with the technology? IF Yes why, if no why not?**	Lateral Virda's have been an excellent source of water. I have my own well since the last twenty years but due to scarcity of rainfall during 1999-2003, it became necessary to dig a lateral virda to fulfill the water requirements.
		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)?	We have to take extra precaution to ensure that lateral virda is devoid of saline water.
		Q5: Do you have equal access?	Yes
		Q6: Are you aware of any misuse of the service?	No
5.	Mr. Parbatbhai Rajabhai Wala (60	**Q1: Are You Happy with the technology? IF Yes why, if no**	This is a very useful

	years)  Village-Rabade, Taluka- Kalol, Distt.-Panchmahal.	**why not?**	technique. The best part is that in a single bore, we can normally dig 4-6 lateral holes. This number has been found to increase even up to 12 holes in the case of our village.
		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)?	If a cheaper technology can be used for digging lateral holes, it would be very good as it proves costly for us.
		Q5: Do you have equal access?	Yes
		Q6: Are you aware of any misuse of the service?	No
6.	Mr. Maheshbhai Bhikabhai Patel (40 years). Village-Rabade, Taluka-Kalol, Distt. –Panchmahal.	**Q1: Are You Happy with the technology? IF Yes why, if no why not?**	We are very satisfied with this technology. It definitely makes much more sense to dig a lateral hole rather than digging a whole new well in such topography. With the arrival of advance technology in form of motors, it is all the more easily to do so.

		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)?	No
		Q5: Do you have equal access?	Yes
		Q6: Are you aware of any misuse of the service?	No.