

Science radio serial of Vigyan Prasar

Ground water: Don't overuse it

Episode- 21

ShrinivasAuli

Characters

1. Mansukh Villager/age 40 years
2. Heera Wife of Mansukh/age 35 years
3. Rambabu Villager/age 55 years
4. Sarpanch Village Sarpanch/age 65 years
5. Garima Village Development Officer/age 35 years
6. Dr. Manoj Ground water specialist/age 50 years

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Announcer: (Welcome + Recap + Intro) Welcome again to this radio serial. In the previous episode we had learnt about the sources of water. But these sources are rapidly getting depleted, especially the water found underground that we call ground water. Ground water is a source that has been used extensively, but never replenished. If it goes on this way then this resource will get exhausted one day. In this episode we will talk about how ground water is being used indiscriminately and the crisis it is leading to.

Let's start with a village in Uttar Pradesh.

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Scene One:

(Sound of boring machine drilling for water/voices of people)

Rambabu: Hey Mansukh, the machine has been running for quite a while. Still did get water?

Mansukh: Oh, Rambabu, come, sit here.

Rambabu: What happened, Mansukh? You look so run down!

Mansukh: (in a sad voice) What to say.... We've already drilled up to almost 25 metres, but still not a drop of water!

Rambabu: Very surprising. 25 metres!

Mansukh: Yes my friend, forget about water, we haven't found even wet clay! Four years ago, when we drilled for a tube well in front of the peepal tree, we got water at a depth of about 20 metres. Today it doesn't produce much water, so we have to dig for a new tube well. But I don't know how deep we'll have to drill!

Rambabu: Then it's a big problem.

Mansukh: Of course, it is. Managing daily household work will be a problem.

Rambabu: That's true. Without water how will you manage farming? You're aware of the uncertainties of rain.

Mansukh: If we depend on rain then we'll have to give up farming. Gone are the days when rains used to come on time.

Rambabu: If this situation continues then there will also be scarcity of drinking water.

Mansukh: Of course. Don't you remember, last summer we had to queue up to get drinking water as most of the wells had dried up?

Rambabu: You're right my friend. Don't know why ground water is becoming so scarce. The whole village is suffering.

Mansukh: But we never had this problem in the past. My grandfather tells me that they had never seen water in wells drying up.

Rambabu: Then why is it happening now?

(Interrupting)

Mansukh: Look, the Sarpanch is coming. Let's ask him about this.

(Approaching footsteps)

Mansukh and Rambabu (Together): Namaste Sarpanchji.

Sarpanch: Namaste, Namaste. How are you?

Mansukh: Things are not going well, Sarpanchji.

Sarpanch: Why, what happened?

Mansukh: You can see, they're drilling for a tube well, but there is no trace of water. If it goes on like this, what will happen?

Sarpanch: That's very true. This problem has become quite common these days. But what to do, we are ourselves responsible for this.

Rambabu: But how are we responsible, Sarpanchji?

Sarpanch: Look my friend. We are drawing out underground water without limit; so it has to become less and less. Mansukh, tell me something.

Mansukh: What's it, Sarpanchji?

Sarpanch: How many tube wells did your grandfather have in his field?

Mansukh: May be one.....or two at the most.

Sarpanch: And how many are there now?

Mansukh : (slowly) One, two, three, four.....and this fifth one. There are five, Sarpanchji.

Sarpanch: So, two have become five. Rambabu, you tell me what's the situation in your farm?

Rambabu: Earlier there were one or two. Now four tube wells are running.

Sarpanch: So, you see, two of you now have 5-6 more tube wells. It must be the same for others too. With so many tube wells running, underground water is bound to get depleted.

Mansukh: You're right, Sarpanchji. But what to do: we need water to irrigate our farms.

Sarpanch: But you should use the water judiciously.

Rambabu: What do you mean by judiciously?

Sarpanch: Judiciously means you must use only the amount of water needed and run the tube well only to get that much amount. You should not misuse or allow the pumped water to go waste only because water is available.

Rambabu: That's right, Sarpanchji. I've often seen water flowing from the tube well, with no one even noticing it.

Sarpanch: You must feel lucky because you're still getting water. Just think of your children. If things go on like this, there may not be any water available in future.

Mansukh: People say the third World War will be fought over water.

Sarpanch: They may be right. The situation is becoming really bad. Water scarcity is becoming more widespread.

Mansukh: Sarpanchji tell me, does this underground water always remain there?

Sarpanch: Yes. There is always plenty of water available between layers of rock underground. We extract this water using tube wells. Technically, this water is called ground water.

Mansukh: How much water is available underground?

Sarpanch: My friend, I'm not a hydrologist who can tell you about this. But if you'd like to know about it, come to gram panchayat office tomorrow afternoon.

Rambabu: Gram Panchayat? What's there?

Sarpanch: Garima Madam had called from the Block office. She said there is campaign going on in the villages to educate people about ground water. She told me that a specialist on water resources will also be coming. If you come you'll be able to get answers to all your questions.

Mansukh: Surely, why not! This is good news. Maybe, he can tell us about how to save the fast depleting ground water. We'll certainly come.

Rambabu: Sure. When should we come?

Sarpanch: He's coming at eleven. You should come a little before that.

Rambabu: Don't worry, Sarpanchji, we won't be late.

Sarpanch: Ok. See you tomorrow.

Rambabu and Mansukh (together): Namaste Sarpanchji.

Sarpanch: Namaste, namaste.

(Changeover music.....fades away)

Scene Two

(Some people talking in low voice. Sound of dragging chairs and tables)

Sarpanch: Come, come. Please have seats.

Rambabu and Mansukh (together): Namaste, Sarpanchji.

Sarpanch: Namaste. Namaste. It's good that you've come early.

Mansukh: They must also be reaching soon.

Sarpanch: Yes. I had spoken to them a short while ago. They're on the way.

Rambabu: Sarpanchji, you've done well to invite people from the village. We must all get to know about ground water.

Sarpanch : (interrupting) Oh, they've already arrived.

(Sound of car stopping)

Sarpanch: Namaskar, Madam. Welcome. We're all waiting for you.

Garima: Namaskar, Sarpanchji. How are you all!

Sarpanch: We are fine, except some problem with water.

Garima: Don't worry. Dr. Manoj is here with us. He's a specialist on water resources and will help you in solving your problems.

Sarpanch: Namaskar, Doctor Sahib. Welcome to our village. Please have a seat.

(Sound of dragging chair)

Dr. Manoj: Namaskar all of you. My sincere thanks to you.

Sarpanch: Madam, We have many people assembled here. Let's begin.

Garima: Sure, sure.

Sarpanch: **(Addressing all gathered)** Friends, let me first introduce our guests to you. This is Garima, who is the village development officer in our area. You might know her already. With her is Dr. Manoj, who is an expert on water resources. I welcome both of you on behalf of the Gram Panchayat.

(Sound of clapping)

Sarpanch: As you may already know, the problem of water is becoming worse every day. Today, Garima and Dr. Manoj will tell us about water.....especially about groundwater that is found underground. If you have any question about groundwater you may ask our guests. First I'll request Garimaji to share her views with the villagers.

Garima: Thank you Sarpanchji. Friends, Namastey. There has been a programme on conservation of groundwater running for some time now. Under the programme, people of different villages are being given all necessary information about the subject. We have come to your village for the same purpose.

Mansukh: Madam ji, we don't understand why groundwater has become such a big problem.

Garima: You have said it right. Depletion of groundwater is a serious problem of modern times. There are many reasons for the depletion of underground water.

Mansukh: Many reasons?

Garima: Yes. The main reason, of course, that we've been using groundwater without any limit. Besides, we've made no effort to recycle the waste water discharged by the industrial plants.

Mansukh: Oh, I see!

- Garima:** Apart from getting depleted, groundwater is also getting polluted which is becoming a very serious problem.
- Heera :** **(Surprised)** What did you say; underground water getting polluted? We always thought pollution remains only at the surface.
- Garima:** Largely, most groundwater sources in our country is unpolluted, but this is not so everywhere. Underground water is increasingly getting polluted. The worst thing is that the level of many substances in groundwater which are harmful for our health is increasing. Polluted water is affecting the entire environmental system.
- Heera:** What are the substances responsible for polluting groundwater?
- Garima:** Substances like arsenic, fluoride, iron, and nitrate are mainly responsible for polluting groundwater. Of these, arsenic is considered the most dangerous. Ten States of our country are most affected by arsenic pollution. The States are: Haryana, Punjab, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, West Bengal, Assam, Manipur, and Karnataka.
- Heera:** But what is the reason for groundwater getting polluted?
- Garima:** There are many reasons... For example, domestic sewage, septic tank waste, Waste from industries – all these are responsible. Apart from these, excessive use of chemical fertilisers and pesticides is also a major reason. It causes high level of pollution of underground water.
- Rambabu:** Doctor Sahib, please tell us how much water is there underground. It must be quite large.
- Dr. Manoj:** You're right. We measure the volume of water in terms of cubic metres. One cubic metre is the amount of water contained in a box measuring one metre in length, one metre in breadth and one metre in height. It is estimated that India maintains an annual reserve of about 440 billion cubic metres of water underground. Of this about 35 billion cubic metres is lost due to seepage. As a result, about 400 billion cubic metres of groundwater is available for the entire country.
- Rambabu:** So much water! Where does all that water come from?
- Dr. Manoj:** The largest source of groundwater is rain water. Almost seventy percent of groundwater comes from rain water. The rest of thirty percent is contributed by other sources such as rivers, canals, lakes.... Some groundwater also comes from irrigation water.

Rambabu: If so much water is going underground, why should we worry about scarcity?

Dr. Manoj: Bhai sahib, there is cause for worry, because we are drawing out much more water from the ground than is going underground. As a result, the water table is falling steadily.

Rambabu: Water table? What's that?

Dr. Manoj: Water table is the depth at which we can find water underground. If we find water at a depth of 10 metres then the water table is 10 metres below the surface. At some places the water table sometimes drops sharply, making wells and tube wells dry up.

Mansukh: Oh! That means the water table in our village has dropped sharply. These days I'm getting a tube well dug, but there is no sign of water even at a depth of more than 25 metres

Dr, Manoj: 25 metres! Then I must say the situation in your village is becoming very serious.

Sarpanch: Sir, what is the normal level of the water table?

Dr. Manoj: Sarpanchji, it varies from place to place. The Water Resource Ministry of Government of India has constituted a Central Groundwater Board. This Board measures the water table in different parts of the country every year. Its Report was published last year.

Sarpanch: What does the Report say about the water table?

Dr. Manoj: On the basis of survey of 14,770 wells, the average depth of water table was found to be between 2 and 20 metres, although in some places it was found to be more than 100 metres.

Rambabu : (Surprised) 100 metres! It's quite a depth.

Dr. Manoj: You're right. The lowest water table was found in Ahmednagar district of Maharashtra where water was found at a depth of more than 153 metres. At some places in Delhi and Rajasthan water was found at depths of more than 40 metres. Compared to previous years, the water table has dropped in most places, except a few.

Rambabu: is it the same in all the States?

Dr. Manoj: No, no. It's not like that. In some States like Assam, Andhra Pradesh, Himachal Pradesh, and Gujarat the water table is at only 2 metres. Water is easily available in these regions. But if enough care is not taken, the water table will drop in these places also.

Rambabu: Then what should we do to maintain the water table?

Dr. Manoj: The first thing we have to do is to ensure recharge of groundwater. That is, we may keep drawing groundwater for use, but we have also to devise ways to keep maintain the groundwater level.

Heera: But we have to withdraw groundwater to meet our needs, isn't it?

Dr. Manoj: You're right. But you have to ensure that you don't waste it. I mean, we may use groundwater but we have also to think of conserving it. I've already told you that the main source of groundwater is rain water. But at present most of the rain water goes waste. It flows into the sea where it no more remains if any use.

Rambabu: Can we stop rain water from flowing away?

Garima: Why not! In olden times, villagers used to dig large pits in which rain water collected and then slowly seeped into the ground. It was a valuable means of recharging groundwater.

Heera: Yes, I remember. In my paternal village I had seen such pits, but later they all became useless. Trees were planted around the pits and today even the trees are not there.

Garima: That's right. Trees and vegetation also help retain rain water. But these days neither can we see large pits for collecting rain water nor groves of trees. And all this has effect on groundwater.

Heera: If water does not seep underground then the water table can only go down.

Dr. Manoj: You've said it right. One the one hand less water is going underground and on the other the use of groundwater is increasing. If there is enough recharge then increasing use will not be harmful. But if recharge is less than consumption then the situation can only become worse.

Mansukh: Oh! In this way water available underground can only become less and less. Dr.sahib, is there a way to find out the past and present status of groundwater?

Dr. Manoj: Of course! We can find out from the percentage of groundwater withdrawal.

Mansukh: What's that?

Dr. Manoj: Suppose in a year, the amount of water from different sources going underground is 100 litres and we draw out only 70 litres. Then the percentage of groundwater withdrawal will be 70, which is quite safe. But if we withdraw 120 litres when the recharge is only 100 litres then the percentage of groundwater withdrawal will be 120, which is a serious situation.

- Rambabu:** Are there places where withdrawal is more than recharge?
- Dr. Manoj:** Yes, there are. Delhi, Haryana, Punjab and Rajasthan are four states where withdrawal of groundwater exceeds recharge amount. The situation is becoming grave in these states.
- Sarpanch:** What is the situation in other states?
- Dr. Manoj:** The situation in Uttar Pradesh, Himachal Pradesh, Puducherry and Tamil Nadu is also worrying. These states are withdrawing more than 70 percent of the recharge amount, which is considered the safe limit. The tendency to withdraw groundwater indiscriminately can have serious consequences in the future.
- Sarpanch:** You're right. If groundwater is used up so fast, there will be little water available in the future.
- Mansukh:** But here do we use so much water?
- Garima:** You may be surprised to know that all of you use too much of groundwater.
- Mansukh:** We? But we use it only for irrigation.
- Garima:** Yes, that's true. In Uttar Pradesh, for example, almost 70 percent of the irrigated land is dependent on groundwater.
- Dr. Manoj:** You may be surprised to know that worldwide more than 2.5 billion people are engaged in agriculture and in India alone more than 270 million people are in some way engaged in agriculture or farming.
- Mansukh:** That's all right, but other people also must be using groundwater.
- Garima:** Of course. In some states, as much as 80 percent of drinking water is provided by groundwater. Besides, as much as 85 percent of water requirement of some industries is met by groundwater. If we continue depleting groundwater in this manner, how will industries run in future?
- Mansukh:** That's right. After all, water, land and forests are intimately linked. We all use water, but no one pays enough attention to the way we use it – neither we nor the industrial barons.
- Dr. Manoj:** An interesting fact is that at the time of Independence, only about 20 percent of the arable land had facilities for irrigation and today the figure is more than 35 percent.
- Mansukh:** That means if we are careful about irrigation we can save a lot of groundwater.

Garima: That's right. But, for this it would be necessary to change the methods of irrigation also. During the past few years irrigation from canals, ponds, etc., has also come down.

Heera: But Madam, when ponds have disappeared from villages and canals are going dry what can we do?

Garima: You are right. The situation in cities is still worse. People there may not be using groundwater directly, but they get piped water, which is actually groundwater carried to homes by pipe from a distance.

Dr. Manoj: Remember, it is our responsibility to save the ponds in our villages. And no govt. scheme can work with active participation of the public. If you have problems with ponds and canals, you can talk to us.

Heera: That's fine, Doctor sahib.

Garima: We should take care that we don't waste groundwater. In fact, I must say that we must stop wastage of water from any source.

Sarpanch: You're absolutely right, Madam.

Garima: Also, we have to renovate old ponds and dig new ponds. We have to build check dams to store rain water, create new forest areas and conserve existing forests to restore and maintain groundwater level.

Dr. Manoj: At the same time, we have also pay attention to the crops we grow. In places where there is continuous fall in groundwater level, we have to think of crops that need less water.

Mansukh: Doctor sahib, you've opened our eyes. We have been harming our own cause by recklessly depleting groundwater. Now we'll keep your advice in mind and use the available groundwater judiciously.

Sarpanch: You're right, Mansukh. I'll also try at the Panchayat level to promote construction of ponds, etc., for recharging groundwater. We should also use rainwater as much as possible for raising the level of groundwater.

(Changeover music.....fades away)

Scene Three:

(Sound of earth-drilling machine, gradually stops)

Mansukh: (In excited voice) At last, we got clear water from this tube well.

(Sound of water gushing out of pipe)

Heera: That's really good news. Now we don't have to lose our crops for lack of water.

Mansukh: True. We did have to drill quite deep, but we got water.

Heera: I think there is no need to be so excited.

Mansukh: But why shouldn't we be happy

Heera: Oh..you seem to be annoyed. I meant to say we have got water. That's fine. But we should remember that we have also to ensure that our children get water throughout their life.

Mansukh: How's that possible?

Heera: Oh, you've already forgotten what Madam Garima told us in our last meeting!

Mansukh: Yes, yes, now I remember. We've got water this time, but it may not remember the same forever. To ensure availability we have to conserve water.
(In a louder voice) Please stop the pump. Water is going waste.

(Sound of gushing water stops)

Heera: I have also made a promise.

Mansukh: What promise?

Heera: I have decided to plant trees in the fallow land lying unused around the village. Madam Garima told us that arrangement for supplying the saplings will be made at the Block level.

Mansukh: That's very good. After all, we have to make provision of water for our coming generations. Heera you'll have to do something.

Heera: What?

Mansukh : (with a naughty smile) Don't forget to send some plants to your paternal village. Maybe, they'll realise the importance of conserving groundwater.

(Everyone laughs....fades away)

(Closing music)

