

Sustainable Development #22

Join Us to Harvest Rain

Script Srinivas Oli

Cast

Rohit: Student of Class 12
Soumya: Student of Class 8
Divakar: Grandfather (elderly)
Govind: Uncle (youth)
Dr. Anwar: NGO manager (youth)

Signature tune: fadeout

Announcer: (Welcome + Recap + Intro) Welcome to the Radio Serial..... In today's episode we will discuss the nuances of rainwater harvesting which is all about storing rainwater and putting it to use later. So, let us join Rohit and Soumya who are visiting their grandfather...let's find out how rain water is being harvested in the hills.

Signature tune

A village in the hills. Birds chirping. Softly playing Flute.

Soumya: Nanaji, the buildings here look pretty ancient ..your home is also pretty old isn't it?

Divakar: Yes Soumya. My father built it. I wasn't even born when this was built!

Rohit: So it is elder to you!

Divakar: Yes...by about a decade. And your Mom isn't even half as old as this house.
Laughs loudly.

Rohit: Mamaji, compared to this house you are a kid!

All laugh.

Govind: You know, Pitaji takes such good care of the house that it doesn't look its age at all.

Soumya: Rightly said Mamaji...but Nanaji tell me something...why are do the roofs of these old houses slope?

Rohit: Great observation Soumya... I had not really taken note of the sloping roofs before.

Divakar: You know, earlier it used to snow quite heavily here. The sloping roofs did not allow the snow to accumulate. Rather it used to slide off easily. And even if a little snow did stick to the roof, it melted quickly and the melt-water drained easily.

Soumya: What was the necessity? Would the accumulated snow have damaged the roof?

Divakar: Definitely. A flat roof would have allowed the snow to pile up. The heavy load would have damaged the roof...maybe even cracked it. Then again there was the risk of water seepage.

Rohit: Wow! The engineers of that age found the technique to prevent this.

Divakar: You cannot underestimate the engineers of yester years...they executed their work meticulously.

Soumya: And Nanaji, what is that pipe like thing running along the side of the roof?

Divakar: Ah! That is also an age old engineering feat that deserves appreciation.

Soumya: Engineering feat? What is that?

Divakar: This is a splendid example of how rainwater can be harvested and used.

Rohit: How so, Nanaji?

Divakar: That pipe-like thing that you see is called Patnala in the local language. Whatever rain falls on the roofs is channelled down these patnalas. All the rainwater is then collected and stored. It is used as and when required.

Rohit: But how do you ensure that the rainwater is collected at one place?

Divakar: That's easy. We have an underground tank. Look at that pipe that is coming downwards from the roof...it leads to this tank. Now, all the water that falls on the roof goes directly to the tank and collects there.

Soumya: To what use do you put this collected water?

Divakar: This water can be used to wash clothes. It can be drunk by cattle or you can even use it to water the plants.

Soumya: Wow!

Rohit: Nanaji, had you not collected this water it would have all gone to waste!

Divakar: Rightly said Rohit. Those who recognize the importance of water conserve every drop; those who are stupid ...well... they underestimate its worth.

Soumya: There seems to be a pit in front of the tank...are these two connected?

Divakar: Yes...the pit is to store excess water when the tank overflows during heavy rains. The water in this unlined pit slowly seeps in deep underground and recharges the groundwater.

Rohit: So are these patnalas, tanks and overflow pits ...all from ancient days?

Divakar: I remember the patnalas from my childhood. We used to place buckets under these patnalas and use the water. The excess used to run off. The pipes, tanks and overflow pits were built much later.

Soumya: Your water conservation ideas are super, Nanaji.

Divakar: Oh no, children...the idea wasn't mine. The credit should go to Dr Anwar.

Soumya: Dr Anwar...who is he, Mamaji?

Govind: Dr Anwar has been working on rain water conservation for the last few years. I have been associated with his NGO for a while now. He has shown the local people how we can conserve water and make the environment better for ourselves.

Rohit: Mamaji, do you think we could meet Dr Anwar. There are some issues about rainwater harvesting that we would like to ask him about.

Govind: That is a good idea. Incidentally, Dr Anwar has come to the village on some work...so we can meet him easily.

Soumya: Let's go then.

Govind: No, not now. He has to attend a meeting till noon...we can meet him in the evening.

Soumya: What shall we do till then?

Govind: Why don't we trek to the forest? Maybe there you will find some answers to your questions even before you meet Dr Anwar.

Soumya: Find answers in the forest? How can that be?

Govind: Aww...come on now...let's go. Let's have some fun.

Rohit: Yes...yes...let's go.

Divakar: Ok children. Take care. Govind, look after the kids.

Govind: Papa, the kids are all grown up...they will take care of me.

Scene transition music

Scene Two

The sound of crickets (insect) calling. Footsteps on dry leaves. Rustling sounds.

Soumya: Lovely woods, Mamaji. These insects are making beautiful music.

Govind: Yes, these insects are called cricket...*laughs*. We call these Jhingur in Hindi.

Rohit: What a lovely, dense forest Mamaji, and so many trees...that too of different types.

Soumya : (interrupting) Mamaji, you said we would find answers to our questions here. There are just trees here. Where are the answers?

Govind: The trees are your answers.

Rohit: I too have failed to understand the connection between trees and rainwater harvesting.

Govind: Trees play a very important role in stopping rainwater runoff. Trees halt the swift runoff of rainwater and enhance the slow seepage into soil. The root system helps the water to percolate down and recharge underground water resources.

Rohit: So this means...trees prevent the wastage of rain water.

Govind: Absolutely!

Soumya: Oh...then we should plant lots of trees...this will save rainwater and give us oxygen too.

Rohit: Very smart Soumya...*laughs*.

Soumya: Mamaji, should we head homewards or are there more answers to be found in the forest?

Govind: We need to go a little up hill to see something interesting. Are you game for the trek?

Soumya: Of course Mamaji, we are ready. It is very enjoyable trekking in the forest.

Govind: Ok then...let's go.

Sounds of footsteps crunching leaves. 3 second music.

Rohit: Surprised...Oh! Lake-like waterbodies so high up on the hills!

Soumya: Yes...but some are quite dry although others still have some water in them.

Govind: These are what I wanted you to see. These lakes are also the answers to your questions.

Soumya : (surprised tones) How so, Mamaji?

Govind: Chaal-khaal is an excellent system of rainwater harvesting

Soumya: (amazed) Chaal-khaal?

Govind: Our ancestors knew the tricks of rain water harvesting. They dug these water bodies at elevated places...in Uttarakhand the local people refer to these as Chaal-khaal.

Soumya: How do these Chaal-khaals work?

Govind: Well, these are not perennial lakes. Basically these are large pits constructed a little away from habitation and at elevated areas. Around the edges are heaped lots of mud and stones...this is what we call Chaal in the local language.

Soumya: OK...so I understand what is Chaal...now tell me what is Khaal?

Govind: Well....Khaals are somewhat larger than Chaals. These are usually constructed on the naturally occurring slopes between two hillsides. Locally these are referred to as Chaal-khaal. During the rainy season water flows down to these chaal-khaals and accumulates there. Once the chaal-khaals are full, the water can be utilized in many ways.

Rohit: Like how?

Govind: Cattle that come to the jungle to graze drink from these waterbodies. Wild animals drink the water too. They do not need to venture to the villages in search of water. The water can be used long after the rainy season is over. However, the most important advantage is that these help in recharging groundwater levels and many other natural sources of water.

Soumya: How does it do that?

Govind: The water that accumulates in the Chaal-khaals slowly seep into the ground. Since these are situated in elevated areas, streams that flow downhill are also recharged easily. By the time, these Chaal-khaals begin to dry up, it is monsoon time again. The cyclic pattern of the accumulation of water and its gradual usage is thus restored.

Soumya: Oh...these Chaal-khaals are very useful.

Govind: There is no doubt about that.

- Rohit:** You said these are traditional ways of water harvesting. Are these practices still followed?
- Govind:** Unfortunately, the practice is in decline. However, not all is lost. There are some people who are still working on it. The District Pauri in Garhwal, Uttarakhand is where Shri Sacchidanand Bharati has established more than 20 thousand Chaal-khaals. Then he planted broad-leaved trees around the Chaal-khaals. For example, **rhododendron etc.** The interesting thing was that many streams of water that had dried up years ago were rejuvenated and began to flow again.
- Soumya:** Oh My! How wonderful.
- Govind:** The nation honoured him with the Indira Gandhi RashtriyaParyavaran Award.
- Soumya:** We need to have many many Chaal-khaals, I think.
- Rohit:** I remember when I went to Rajasthan to visit a friend I saw these big lakes that were actually filled with rainwater. People used the water to wash clothes and brought their animals there to drink.
- Govind:** Quite right Rohit. I am aware that Rajasthan has a robust heritage of water harvesting. Tanka is a traditional rainwater harvesting technique, commonly seen here. Tankas are small pits dug to catch and store rain water. The Naadis are much larger waterbodies where rain water is caught and stored. In the last few years they have also built Johars in Rajasthan.
- Rohit:** What are Johars?
- Govind:** These are simple dam-like barriers made of mud and rubble and built across the contour of a slope to collect rainwater. It looks like a lake.
- Soumya:** So you can dig small pits or ponds and even large lakes to collect rainwater.
- Rohit:** This will allow us to address the issue of water scarcity across large areas of our country! Won't it, Mamaji?
- Govind:** I cannot talk about things on such a large scale...only specialists can do so. And the ne specialist I know is Dr Anwar...let's go and meet him.
- Rohit:** You know quite a lot too, Mamaji but I am sure Dr Anwar will have yet more to tell us.
- Soumya:** Well, let's go then! Come on.

Scene transition music

Door bell rings. Door creaks open

- Dr Anwar:** Welcome...welcome. Come in children. Come in Govind.

Soumya and Rohit: Namaste Uncle.

Govind: Namaste Sir.

Dr Anwar: Namaste, Namaste. I met Divakarji walking down the road...he told me you would come. You seem to have spent a long time in the jungle.

Soumya: It is such a lovely jungle we could not tear ourselves away from it.

Dr Anwar : **(laughs)** Ha hahaa...that it is! So, what did you see there?

Rohit: Well we saw lots of trees...many types of trees actually. Mamaji explained how the trees prevent the wastage of rain water.

Soumya: **(interrupting)** Yeah...yeah and we also saw...also saw...what do you call it...Khaal-khaal.

Govind: Not Khaal-khaal, Soumya. It is Chaal-khaal.

Everyone laughs

Soumya: **laughing.** Yes, yes Chaal-khaal. What fabulous technology to harvest and reuse rain water.

Govind: I have explained what little I know. Now they can ask you other questions.

Dr Anwar: I have full faith in you Govind and I am sure you have explained everything very well. Still, if there is anything else that you kids want to know...I am here. Ask me.

Rohit: They say we must save water yet I see so much water in lakes and rivers.

Dr Anwar: Well, you should know that there is ground water and there is surface water.

Soumya: What does that mean?

Dr Anwar: There are large reserves on water under the ground too. This is called ground water. We can use hand-pumps or tube-wells to take out ground water. The other reserve is surface water...for example water flowing in streams and rivers.

Rohit: So, the availability of water depends on both ground water as well as surface water.

Dr Anwar: Rightly said, Rohit. If we take into account water resources of different types then we can say we have adequate reserves in the country. Yet the question is whether we are able to use the reserves sustainably.

Rohit: How....

Dr Anwar: It is estimated that our country has water reserve of 2 thousand billion sq m taking into account both ground water and surface water. Many of our rivers are perennial and contain water around the year. On an average we receive about 117 cm rainfall annually. We get about 4000 sq km of water from just the rainfall.

Soumya: That is a lot...yet why is there scarcity of water in some areas?

Dr Anwar: That is exactly the problem. Even though the nation is blessed with so much water, parts of it remain parched. Even areas where substantial amount of rain falls often face water scarcity. The trouble is that the water is not used sustainably. Even today about 47 per cent of the water is wasted. The fresh water of the rivers flow into the salty seas.

Govind: How wonderful if we could save even a small fraction of this water...

Dr. Anwar: Well, people across the world have been striving for generations to conserve rain water. Just imagine from the ruins of 4500 year old Harappa we have found evidence of ancient rain water harvesting system. Evidence has also been found from Petra in Jordan and Sigiriya in Sri Lanka. These are all part of our global heritage.

Soumya: What are the other avenues open to us to harvest rainwater?

Dr Anwar: The easiest is to use rainwater to recharge ground water reserves. You need to dig a large pit in which rain water collects. This percolates slowly down and adds to the ground water reserves.

Rohit: Oh...just like Chaal-khaal.

Dr Anwar: Yes..just like that. These days even large organizations are constructing trenches across the land slope along the boundary walls. These are called Recharge trenches.

Rohit: Mamaji was telling us about the different types of rain water harvesting techniques practiced in India; particularly in Rajasthan.

Dr Anwar: Yes that is correct...you see Rajasthan has negligible numbers of perennial sources of flowing water. So, the populace learnt to conserve water in many different ways. There has been a long tradition of preventing rainwater from flowing away by restricting it to pit, the sides of which are reinforced with rocks or rubble. Then, it would be diverted to larger tanks or lakes via aqueducts made with stone.

Soumya: And the patnala type arrangement we saw in Nanaji's house is a good innovation too to conserve rainwater.

Dr Anwar: Indeed it is. Actually the entire surface of a build's roof can serve as a catchment area. The entire amount of rain that falls here can be collected and stored in a tank. The water can be used even after the rainy season is over.

Govind: And rain water is cleaner than the surface water.

Soumya: How is that possible, Mamaji?

Govind: Rainwater does not have dissolved salts in it. Water in contact with the ground carries dissolved salts such as fluorides and nitrates. So, rainwater is fit to be used for multiple purposes.

Rohit: Nanji practices this.

Dr Anwar: He is a pioneer in conservation practices. He has set a good example. Many villagers are emulating him now.

Rohit: That is good....but this practice should be adopted n a larger scale.

Dr Anwar: Yes, awareness is spreading slowly. Some states, such as Tamil Nadu, Delhi, Haryana, Himachal Pradesh and Karnataka have made it mandatory for new buildings to incorporate water conservation measures.

Rohit: Is rainwater potable? I mean can we drink it?

Dr Anwar: After purifying rainwater it becomes fit for drinking. In some areas purified rainwater is used for this purpose.

Govind: Sir, I recall that this is being actively encouraged in some areas.

Dr Anwar: Some state governments are giving tax rebates and subsidies to people who are adopting water conservation measures. Community halls and places of worship etc., where people congregate are being used as sites to propagate the idea. Some temples in Tamil Nadu have constructed underground tanks to conserve water and recharge ground water.

Rohit: This is excellent.

Dr Anwar: The National Green Tribunal has taken up the matter of water conservation very seriously. In March 2016, the NGT issued directive to the Delhi Jal Board and Central Groundwater Board to implement uniform rules and laws pertaining to rainwater conservation and ensure that this uniformity extended to hospitals, hotels and malls too.

Govind: Yes Sir. I remember NGT had fined some hospitals, hotels and malls for not conserving rainwater adequately.

Dr Anwar: Every section of society should take this seriously. The alarming rate at which groundwater levels are going down is clearly evident. Rainwater conservation

will work when every individual acts. It will not help if everyone expects intervention from higher levels or from organizations.

Rohit: Self help is best....that is so true!

Soumya: After we return home, let us try and impress upon our Housing Society members, the importance of rainwater conservation.

Rohit: Yes. Of course.

Soumya : **(in a sad tone)** But the roofs are so dirty!

Dr Anwar: Dear Soumya...don't worry. There are ways and means to prevent the water from the first shower from entering the water storage area. The first shower washes away the dirt and only the clean water from the subsequent showers enters the storage tanks.

Rohit: This is good news, and Soumya I will help you in your efforts. I will rope in the members of my Baal Vigyan club.

Govind: Sir, it is time we took your leave. Not just the kids but I have also benefitted from this interaction. Many thanks.

Dr. Anwar: Not at all. Feel free to drop in. **(Laughs)** And if you have any trouble with harvesting rain water, remember I am always here.

Rohit & Soumya: Thank you, Uncle. Good bye.

Footsteps that fade away.

Closing music