



Programme Script

“What soils are made of and what if they didn’t exist.”

by [Kyoto Sanjo Radiocafe](#)

Part 1

Shizuko: Hi, everyone. I’m Shizuko Shimomura.

Aki: Hi, I’m Miyachi Aki.

Shizuko: We also have another volunteer staff member to have a say.

Moto: Hi, everyone. The other day my friends and I went to a restaurant and met a foreign guy who kindly gave his table to us and even paid for us. I just wanna thank him through this radio. “ To the kind gentleman who treated us for lunch the other day. I hope you are listening to this. Even if not, we are just wanting to say thank you for the very kind caring things you have done for us. Thank you very much.”

Shizuko: We hope he’s listening to this.

Shizuko: This week and next we are going to talk focusing on soils. We have a guest, Mr. Ikuo Sugimoto, president of Citizens Environmental Foundation.

Ikuo: Hi, everyone.

Shizuko: Have you stood or walked on soils recently, Aki?

Aki: Not really.

Ikuo: Hahaha, I guess so.

Shizuko: We usually have you talk about environmental issues, Ikuo. But today you’ll talk about soils.

Ikuo: Actually I studied agrology at college. It’s been a long time since then, though. I’ll try my best to let listeners know more about soils. By the way, do you know when around soils were created on earth?

Moto: I don't know...

Ikuko: Rocks, stones, sand... Those are parts of soils. And soils are where plants grow. These are clues to the answer. It's said some 470 million years ago, a kind of moss landed from the sea followed by microbes. Then the moss managed to stretch roots around rocks, breaking them into small pieces. The microbes found more pleasant to live under those pieces than on the land because at that time they had stronger ultra violet light on the land and the temperature changed more drastically there. In the soils, however, about 30 cm under the ground, the temperature barely changes. As microbes lived there, they digested died plants and dead bugs. This was how soils began to emerge. We believe soils became almost what we know today about 370 million years ago. The reason is that the first forests of fern are known to have appeared those days and it must have been impossible without rich soils.

Shizuko: So soils were gradually created with creatures.

Ikuo: Exactly. Now let's talk more about what soils consist of. What do you think exists in soils other than rocks and sand?

Aki: Well, microbes?

Ikuo: Right. What else?

Shizuko: Water?

Ikuo: Yes. And...

Aki: Air?

Ikuo: Great! You guys know very well. About 40% of rich soils consist of sand and tiny stones. And 30% is water and another 30% is air. Well, a few percentages of soils are decayed plants. And in there, a variety of creatures such as moles, earthworms, and bacteria live. Soils are actually warm and humid environment with air and water, pleasant for creatures to live. It itself is a huge different ecosystem from what we have on the land or in the sea. And it supports various creatures on the land.

Shizuko: We've got more interested in soils.

Ikuo: Great. Soils apparently support plants. And you know plants support all the creatures on the land. When the plants decay or die, many kinds of bacteria and fungi decompose them back to nutrition.

Shizuko: Cycle....

Ikuo: Yes, indeed. The ecosystem on earth couldn't work without soils. So I'd like you folks to be more interested in soils.

Shizuko: Aki, you wanna walk on the soils on your way back home, don't you?

Aki: Yes. I've got more interested in soils.

Shizuko: Gardening has been popular recently. But many people don't usually touch soils in their everyday lives. I'd like listeners to use this opportunity to think more about soils.

Ikuo: Yes. Now I'd like to add a bit of talk about earthworms. Do you know what they do in soils?

Aki: Well...

Ikuo: We know many earthworms make rich soils. Why?

Shizuko: They eat something and do something...

Ikuo: Yes. They actually eat soils. And they put them out, turning them very warm and soft. It means they cultivate soils, which we should appreciate.

Shizuko: We get it. Thank you, Ikuo. We'll talk more about soils next week.

Part 2

Shizuko: Hi, everyone.

Aki: Hi, there.

Shizuko: And we have...

Yukihiro: Hi, everyone.

Shizuko: Yukihiro, you've listened to the first part of the programme, right? What did you think of it?

Yukihiro: It was impressive that soils are composed of air, water, microbes, and so on.

Shizuko: Yes it is. We found we hadn't known enough about soils which are close and important to our lives. We're going to talk more about soils with Ikuo again. Hi, Ikuo.

Ikuo: Hi, there.

Shizuko: We learnt soils were created in close relationship with plants. So we imagine soils are deeply related to agriculture.

Ikuo: Exactly. These days more people have been familiar with organic

agriculture. By the way, do you remember what are the three major nutrient factors for plants?

Aki: Well... water?

Ikuo: It's not a nutrient factor, though it's necessary.

Shizuko: Chlorophyl?

Ikuo: It's what plants have.

Yukihiro: Sun light?

Ikuo: Well, it's also necessary, but...

Shizuko: We all don't know...

Ikuo: Though they are all needed, the nutrient factors are nitrogen, phosphoric acid, and kalium, which are all inorganic materials. In organic agriculture we use decayed plants and foods, putting them into soils. But actually plants can't eat them. Then why do we dare to provide them for plants? Isn't it strange?

Shizuko: Yes.

Ikuo: So what is it that eats those organic materials?

Shizuko: Who?

Ikuo: Bacteria and microbes in soils do. And they decompose organic materials into inorganic ones which plants can absorb. So without those creatures in soils, plants can't have nutrition whatever organic materials are given. So we can say that organic agriculture is indirect agriculture. There is chemical agriculture, on the other hand, in which chemical materials are given so that plants can directly absorb nutrition out of them. It's easy for plants to get nutrition then. But it's important we dare to provide nutrition indirectly. Why? What do you think will happen if we continue to put chemical materials into soils?

Shizuko: Well, soils will be unhealthy.

Ikuo: Yes, they'll get poor. And more bugs live with plants, causing more demand for bug killer. Then soils will turn into the world of death, becoming solid. After all soils won't be able to foster plants whatever amount of chemical nutrition is provided.

Shizuko: We learned we have as rich world in soils as in water. But chemical agriculture would destroy that...

Ikuo: Yes. In organic agriculture, instead, we provide organic materials that soils can eat.

Shizuko: In organic agriculture we enrich soils...

Ikuo: Yes. We feed soils. By the way, think what cows, swine, and chickens eat. They eat plants raised by agriculture. In that sense, almost all foods are based on agriculture. It shows the importance of agriculture and soils. By the way what else do you think agriculture contributes to? Of course it creates good natural sceneries. But what else? What are inevitable for human lives? Food and ...?

Aki: Air.

Ikuo: Yes. Air, especially oxygen. What makes it?

Shizuko: Plants.

Ikuo: It means we need soils that cultivate plants. And what else?

Shizuko: Water?

Ikuo: That's it. How can we get pure clean water? How does rain turn drinkable?

Shizuko: It goes underground and comes up...

Ikuo: Exactly. Soils function as a big water bottle.

Shizuko: That reminds me of the story we had the other day about mountains which keep much water.

Ikuo: Yes. Soils and plant roots spreading through them keep water. And they purify water as well. So in Japan water gets drinkable by some little extra treatment. Now you understand very well that soils are inevitable for human lives.

Shizuko: Human-beings cannot live without soils.

Ikuo: Absolutely not.

Shizuko: But these days soils have been wiped away by exploitation and lands have been deserted.

Ikuo: Right. Desertification means that lively soils all die to dead sand. The world of lives turns to that of death. If the dead sphere expands, the base for all the creatures including human-beings gets lost.

Shizuko: We now understand soils have much to do with environmental issues. We may try to increase soils by taking asphalt away!

Ikuo: We should let soils more appear to us. Covering nature by asphalt too much has been causing various problems.

Shizuko: Indeed. We've listened to Ikuo about soils this week. Thank you, Ikuo.

Ikuo: Thank you very much.