

# Pack 111, Item

Type: Interview

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**Senegalese farmers struggle to find solutions to soil salinity**

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Notes to broadcaster

Salinization of soils, meaning higher than usual levels of salt in the soil, is one of the major environmental problems facing the world, and in particular, small-scale farmers. In coastal Senegal, frequent movements of salt water into groundwater or river water and a continuous decrease of annual rainfall help increase soil salinization.

As this script outlines, while some crops can grow in soil with a certain level of salt, high salt content makes crop production virtually impossible.

Soil becomes saline (salty) in a variety of ways. Near the coast and in river estuaries, salty seawater can invade low-lying land. Poor irrigation and land drainage practices can also increase salt content in the soil, especially when irrigation water is salty.

This script explores the problems of soil salinity in Senegal and introduces some of the solutions that small-scale farmers have used to try to address the problem.

This script is based on actual interviews. You could use it as inspiration to research and write a script on soil salinity or a similar topic in your area. Or you might choose to produce this script on your station, using voice actors to represent the speakers. If so, please make sure to tell your audience at the beginning of the program that the voices are those of actors, not the original people involved in the interviews.

You could also use the script as research material or as inspiration for creating your own programming on saline soils. Talk to farmers, agricultural officers, and other experts. You might ask them:

* What is the history of soil salinity in the area?
* What is the impact on farmers?
* What solutions have farmers and other experts found to address these challenges?

Apart from speaking directly to farmers and other experts, you could use these questions as the basis for a phone-in or text-in program.

The estimated running time for this item, with signature tune, intro, and extro, is 15 minutes

**Speakers**

**Farmer 1:** Ousseynou Sokoma, farmer, co-owner of the farm, *Les jumeaux* (The twins)

**Farmer 2:** Assane Sokoma, co-owner of the farm, *Les Jumeaux*

**Farmer 3:** Moustapha Cissé, Chairman of the National Union of Agricultural Cooperatives

**Specialist:** Yacine Badiane, Director of the National Crop Production Research Laboratory, Senegalese Agricultural Research Institute

**HOST:** Soils in many sub-Saharan African countries have a high concentration of salt. This directly affects crop production, and leads to a decrease in yields over the years.

This is the case in Senegal where many areas are affected, especially Sine Saloum, which includes Fatick and Kaolak regions. There, we met farmers who were affected by saline soils. In the absence of effective and accessible solutions that could help them produce in spite of the high salt content, we heard that farmers grow other crops that are more resistant to salt or simply shift to extracting salt to earn a living.

(PAUSE)In Ngane, in Kaolack region, we met Assane and Ousseynou Sokoma, twins who operate a farm together. Please tell us how things work on your farm.

**Farmer 1:** We have a 600-square-metre farm, but things did not work as we expected or as we would have liked them to. Some years ago, my twin and I decided to return to Senegal to invest in farming here in Ngane, but without considering the type of soil we were dealing with. At the beginning, we planted many kinds of crops, including many types of vegetables, in order to get good yields for marketing. A few weeks later, we noticed that the soil was saline and the strong impact this had on our crops. As a result, the yield did not meet our expectations, much to our disappointment.

**HOST:** What types of crops did you grow at the beginning? Give us some examples.

**Farmer 2:** We grew pepper, green pepper, some varieties of lettuce, and beans. A few weeks into the season, we realized that the plants were not growing normally—that there was a considerable delay in growth and difficulties with plant development. We noticed that the water from the wells we used to irrigate the plants was salty, and we decided to stop watering them.

To solve this problem, we decided to go to town and to areas where the groundwater was not salty to get water for plants. But we couldn’t continue with this because it was exhausting and expensive. We needed a lot of water and it became difficult and even impossible to transport it to the village. Consequently, we lost much of the expected yield that year.

**HOST:** Did you try to find solutions to this soil salinity?

**Farmer 1:** Yes. According to the information we collected, the soil pH is basic, that is, it was higher than 7. Skilled farmers recommended that we try to reduce the amount of salt in the water from wells. But that didn’t work.

**HOST:** What method did you use to reduce the salt content exactly?

**Farmer 1:** We added coal to the wells to reduce the salt. But it didn’t work, so we abandoned it.

Unfortunately, we paid 450,000 CFA francs (about $775 US) to dig the well and only realized later that the water was salty. Some farmers suggested that we dig a well at another place in the farm. This would have cost the same as the first, but there is no guarantee that we would find non-salty water. It’s a question of luck, and under these circumstances, investment is risky.

**HOST:** Were you taught how to apply this method of using coal skillfully?

**Farmer 1:** No. We were just taught how to add coal to the well. We had to add a few pieces of charcoal and then wait a few hours before checking the water. Unfortunately, either the method was not effective or we failed to apply it correctly.

**HOST:** And now?

**Farmer 1:** Our efforts didn’t help, so we gave up these crops because we had huge losses. As you can see, we are just growing eggplants now. And they are not growing as they should. Things are slow.

Apart from vegetables, we also reared poultry. We had hundreds of chicks, but as their development was also slow, we abandoned this activity. In the long term, they weighed less than chickens raised on farms in non-salty areas.

**HOST:** Did you consider other solutions?

**Farmer 1:** Yes. We learned about a system designed to reduce salt content in well water used to irrigate fields, but we couldn’t afford it.

**Farmer 2**: It required an investment of about five million CFA francs (about $8,600 US), and we didn’t have the money.

**HOST:** Yacine Badiane is the Director of the National Plant Production Research Laboratory of the Senegal Agricultural Research Institute. Mrs. Badiane, after hearing this story from farmers, can we say that salty soils are not good for crop production?

**Specialist:** You know, saline soil varies from one place to another. There are less salty soils and very salty soils. Most crops can’t withstand salt when the content is high. It should be noted that plants just need small quantities of some micronutrients, while salty soils have plenty of them. This cause various problems to plants.

**HOST:** Are there crop varieties that can withstand a higher level of salt in the soil?

**Specialist:** Yes. For example, there are rice varieties bred by the Senegal Agricultural Research Institute that can be grown in salty areas. When you look at Fatick or Casamance, rice is mainly grown in lowlands, in salty areas. There are also varieties of Irish potatoes and tomatoes that can grow in salty soil. The fact remains, however, that crops grow only when the salt levels are not too high.

**HOST:** As we just heard from Mrs. Badiane, Fatick Region is affected by soil salinity. Moustapha Cisse is the chairperson of the National Union of Agricultural Cooperatives. Can you explain the situation, Mr. Cisse?

**FARMER 3:** Indeed, farmers from Fatick are really affected by soil salinity. There are areas where it is difficult or even impossible to farm. For example, this is the case in Passi, where most farmers lost hectares of crops.

**HOST:** What are things like in the part of Fatick that’s affected by saline soils?

**Farmer 3:** Usually, salty soils have a whitish colour. You can clearly see that they look different than soils in areas which are not affected by salt. Here, soil salinity has intensified in recent years, much to the dismay of farmers. Neither millet, maize, nor groundnuts—which are the main crops in this area—grow normally anymore. Not only have the crops matured slowly, but they are poor quality and have low yields.

**HOST:** What is the fate of farmers who invested in this area?

**Farmer 3:** Some have changed crops. Others grow crops such as rice which are more resistant to salt. Others have shifted to harvesting salt. This is a profitable market, so it prevents them from being jobless and helps them make a decent living.

**HOST:** What causes soil salinity? Is it a natural phenomenon?

**Specialist:** You know, salty soil can be due to many factors. Farm practices may cause it. If farmers irrigate land where drainage and water management are not done normally, this may lead to secondary salinity.

When soil salinity is caused by human activities such as agriculture or urbanization, we call it secondary salinity.

But salinization can also be caused by salty irrigation water. For example, in the village of Ngane, in Kaolak region, the groundwater is salty. So, when we irrigate and then the water drains out of the soil, some of the salt stays in the soil and the salt concentration increases. There is another phenomenon called sea intrusion. In areas near the sea where there is a depression, salty sea water moves to the lower land, making it saltier than higher land.

**HOST:** Mrs. Director, are there cultural methods or techniques that could enable good production despite soil salinity?

**Specialist:** Some techniques were developed through research. But everything depends on the level of salinity. At a certain level of salinity, it is necessary to use mechanical control methods. There are also chemical control methods and biological control through plantations. In the past, some forest projects such as the Community Reforestation Project in the groundnut basin and the Natural Resource Self-promotion and Management Project) in Sine Saloum built stone lines and planted plants with a great capacity for absorbing salt, including *niaouli* (*Melaleuca leucadendron*), the hardy beefwood (*Casuarina equisetifolia*). These species help tackle the dunes that result in the silting of market gardens basins in Niayes area, and the *Prosopis juliflora* in Sine-Saloum. The farmers got satisfactory results from planting these species. But, once again, everything depends on the level of salt in the soil.

For salinity that is caused by natural phenomena like climate change and sea intrusion, there is a need for mechanical methods. Dikes should be set up to prevent sea water from seeping into the ground. For secondary salinization generated by poor farming practices, farmers need to be trained to reduce or even anticipate the salinity process. For example, farmers can avoid getting water from irrigation canals and use river water instead. Using river and rainwater should be promoted.

**HOST:** Are these methods accessible? Most farmers don’t have a lot of funds. Can they afford these methods?

**Specialist:** The chemical control method of adding charcoal is accessible. The Senegal Agricultural Research Institute, the National Pedology Institute, and the National Agency of Agricultural and Rural Council train farmers on chemical methods. But mechanical control methods require heavy funding. For instance, the government developed projects like the Support Project for Small Local Irrigation, which builds dikes. These require big investments that farmers cannot afford, so a donor, a project, or the state needs to support them.

**HOST:** Despite the Senegalese government’s efforts to reduce soil salinity, farmers struggle to grow many crops, especially in areas where groundnuts, millet, and vegetables are the main crops. Here and elsewhere in the country, farmers are being invited to stop using practices that hamper efforts to reduce salinization. Soil salinity compromises crop production, which has become a major challenge to Senegal’s economic development.

## Acknowledgements:

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Reviewed by: Djibril Ba, water and forest engineer, forest management expert

**Sources of information**

Interviews:

Ousseynou Sokoma, producer, co-owner of the farm “*Les jumeaux*”

Assane Sokoma, co-owner of the farm

Moustapha Cissé, Chairperson, National Union of Agricultural Cooperatives

Aliou Ba, agricultural stakeholder, Kaolack

Yacine Badiane, Director of the National Crop Production Research Laboratory, Senegal Agricultural Research Institute (ISRA)

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