If I Had




Farmers in Kimutwa, Machakos county, Kenya are "praying" that it will rain. It's been declared a failed season for agriculture and rainfall is becoming more infrequent.

1 Cecilia and Philip Munguti run a small farm in Kimutwa. "It's a disaster, my crops have dried up because there's not enough rain. We could have eaten them or sold them. If I could get water from a borehole, I could irrigate; it would not be like this," says Cecilia.

2 Around 80% of Kenyan farmland is classified as arid and semi-arid with low and erratic rainfall. But with no water for irrigation, from wells or boreholes, most farmers rely on the rains.

3 The Munguti family used to have water that came directly from the hills into their village tank, but now the tank is empty.

4 Dried up rivers, ponds and empty water tanks are a common site in Kenya. Whether for farming or domestic use, there's simply not enough water. One farmer says: "We're in trouble, facing starvation."

Water...

by Louise Potterton




An IAEA project is showing these farmers, who depend on rain-fed agriculture, how to grow crops in the driest of seasons using isotope-based water, soil and nutrient management practices.

5 The Munguti family uses this rain-filled pond, the Kwa-Aka dam, for water for washing, cooking and drinking. The water is heavily polluted with animal waste and from soil erosion.

6 Cecilia and her family rely on this water, there's no alternative: "The water is dirty. We have to boil it before we use it. Some animals even die when they drink it. There are worms and liver flukes in there," she says.

7 Philip Munguti says: "The water in the pond is dangerous, animals come here too to drink and they pollute it. It's used by nearly 2,000 people. People walk far to get here, but when the water is gone, we will need to go even further to get it."

8 People walk for up to 10 kilometres to reach the Kwa-Aka dam. One local woman explains: "We need to get our water for domestic use from here. We use our backs to carry it. It's dirty. It makes people ill. There are people in the local hospital with typhoid."

9 The IAEA is working with the Kenya Agricultural Research Institute (KARI) to help farmers like the ones in Machakos, grow healthy crops despite the lack of rain with the support of nuclear and isotopic techniques.

10 KARI soil scientist Kizito Kwena, who was trained by the IAEA in Vienna, Austria, is using nuclear science to conduct research on plants that thrive with little water, retain moisture and improve soil fertility. He shares that knowledge with local farmers.

11 Some farmers' crops have withered in the drought. The little water available to this community from the Kwa-Aka pond is needed for domestic use and is insufficient for irrigation. One farmer says: "Our season was so bad, there's not enough food."

12 At this IAEA experimental site the crops are thriving despite the lack of rainfall. Kizito Kwena says: "We have a variety of crops under different cropping systems and we need to figure out the most water efficient ones and this is where nuclear techniques play an important role."

13 The IAEA project is also supporting the cultivation of the legume "pigeon pea" in Kenya. Nuclear-based research has shown that the plant is not only drought-tolerant but also improves the soil's capacity to retain water. Furthermore, it acts as a natural fertilizer for present and future crops.

14 For some farmers in Machakos, the IAEA project is showing benefits. Many crops have indeed died, but the pigeon pea and cassava are surviving, thanks to good soil and water management practices, supported by nuclear science. "I've used pigeon pea as a fertilizer and it's working really well," says Cecilia.

Since these photos were taken in June 2011 the Kwa-Aka dam has dried up.

Photos: Louise Potterton and Petr Pavlicek/Division of Public Information • **Text:** Louise Potterton