New Technology Holds Promise for Farmers in Water-Scarce Nile Delta

In Egypt, the effects of climate change are becoming increasingly evident. Here, agricultural land is degrading, temperatures are rising and water is becoming incredibly scarce. A new plough is making sustainable farming and irrigation practices more accessible to farmers.

Key messages

- Egypt suffers under severe water scarcity, which threatens food production
- New, affordable plough makes it easy for smallholders to adopt raised-bed farming practice
- Raised-bed farming saves water and increases yields
Water crisis threatens food production

Egypt is facing a severe water crisis. With just 600m$^3$ of water available per person per year, the scarcity of water is likely to have irreversible consequences for the food system and economy.

Agricultural production is at risk of decreasing by between 8 and 47 percent by 2060, and employment opportunities are dwindling by up to 39 percent. Already, millions of Egyptian farmers are struggling to eke out a living.

Finding ways to sustainably intensify agricultural production, that is, to grow more food with less water, will be essential the future of farmers in the Nile Delta. A new, affordable technology is showing significant promise.

New, affordable plough makes saving water easy

To optimize farmers’ use of the scarce water resources available, scientists began to test new economically viable and environmentally sound irrigation practices in collaborating with smallholders. One such practice was raised-bed farming, which conserves water and soil.

The results of the raised-bed farming trials were particularly promising. Therefore, scientists went on to develop an affordable plough, which can make it easier for smallholders to practice raised-bed farming.

“My own father was opposed to switching from our old ways, but when he saw how much water can be saved, he was convinced,” said Atef Swelam, the scientist who developed the plow on behalf of the International Center for Agricultural Research in the Dry Areas (ICARDA). “Raised beds are difficult to make manually and are expensive, but with this machine it’s simple.”

The new plough can establish broad bed furrows with appropriate width and height, while simultaneously planting seeds on those beds, and it is suitable for small to medium sized farms. Researchers developed a prototype and made it available to the private sector, thus prompting the establishment of a public-private partnership for the local manufacturing of raised-bed ploughs. They sell for just US$5,000 a piece.
Raised-bed farming boosts yields and incomes

“For a thousand years, my family has been working the land the same way - flooding fields and planting seeds by hand,” said Abdullah Sheikh, a farmer in the Nile Delta. “But this machine saves us much labor, seeds and effort.” By using the raised-bed plough, Sheikh has nearly doubled the yields of his two acres of wheat, while using about a third less water.

In pilot areas, the use of raised-bed farming resulted in a 25 percent saving in irrigation water, 30 percent increase in wheat yield and 74 percent improvement in water use efficiency (average over four years, 2011-2014). Farmers’ incomes increased by more than 10 percent.

It is estimated that through the promotion and adoption of this technology, water savings for wheat cultivation in Egypt could amount to more than 1.5 billion m3 per year. With farmers’ adoption of such practices at a large scale, for winter and summer crop rotation, at least 6 billion m3 of applied water could be saved in the country’s water system.

Wide-scale uptake in Egypt and beyond

In 2011 and 2012, the Egyptian government launched a nation-wide campaign to convince farmers to use raised-bed farming for their wheat production. The government supported the campaign with US$1.7 million, and 1,900 demonstration fields of raised-bed farming were established.

Since then, the practice has been taken up across the country. In 2015, 105,000 hectares were under raised-bed farming in Egypt, and the practice is being put into use in other countries such as Ethiopia, Eritrea, Iraq, Jordan, Morocco, Nigeria, Uzbekistan and Sudan.

Raised-bed farming is allowing farmers in Egypt, and elsewhere, to sustainably use and manage water while increasing their production yields and incomes, thus making them more resilient to climate change impacts in the process.
Acknowledgement

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References


Outcome Story Coordinates

Country: Egypt
Region: East Africa
Agricultural livelihood system: Irrigated
Cross-cutting theme: Climate change
CGIAR SLO: Improved natural resources systems and ecosystems services (~3.3 Agroecosystems sustainably managed)
SDG: SDG 15: Life on Land

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