

Burkina Faso: Can 'ripping' boost small-scale farmers' productivity?

Ripping (a land preparation method used in Conservation Farming) promises to cut down labour costs to a tenth of current practices in northern Burkina Faso, while conserving soil moisture.

Burkina Faso: Erosion, Desertification and Innovation

Located at the frontlines of the Sahara desert, desertification has been a perennial threat in northern Burkina Faso. The threat perception is based on recurring droughts (1910-14, 1969-75, 1980-85, 1987-88, 1998, and 2002). Over the past 50 years, the region's environment has had to contend with reduced rainfall, diminishing vegetation, and disappearance of several species of plants and animals. Erosion has completely removed the top soil in some areas. Farmers are up against hard, dry soils to work with.

A bright spot has been the increasing

adoption of Water Harvesting Technologies (WHTs) by small-scale farmers, catalysed by farmer-farmer learning systems and champion farmers. Thanks to these technologies, (most notably Zai planting pits, stone lines, etc.), farmers have been known to increase yields to up to 1200 kilograms/hectare, from the 0-300 kilograms/hectare possible without WHTs (based on yam, cotton and cassava).

Nevertheless, the problem of hard, dry soils persists. Farmers have adapted to this with Zai planting pits, which capture runoff and improve its infiltration into the soil, focussing it at the root zone of the plant. As mentioned



Land being prepared with a Magoye Ripper at a WAHARA field trial in Ziga, Burkina Faso
(Image Courtesy: MetaMeta)



A field prepared using a 'Ripper' (Image Courtesy: Piet Stevens, ACA Technologies Zambia)

before, this has helped improve yield. However, as a land preparation method Zai pits are quite labour-intensive. It takes 8-10 people to prepare 1 hectare of land in a day. Also quite demanding is the maintenance that needs to be done every winter, to make sure that the pits' shape, size, and organic content are optimum.

Ripping: A Land Preparation Alternative

Under the EU-funded WAHARA (Water Harvesting in Rainfed Africa) project, the Magoye Ripper, a land preparation implement developed and used in Zambia, was trialled at 30 small farms in northern Burkina Faso. The animal-drawn implement is used to create rows of linear grooves in the soil in which seeds are planted and inputs applied. Spaced 80-90 cms apart, the same rip lines are refreshed every year, so that the soil between them stays undisturbed and moisture loss to evaporation is minimized.

In all the 30 farms, part of the land was prepared with the Magoye Ripper, alongside parts with Zai pits, and unprepared parts that served as control plots. Various combinations of different crops and fertilizers were tried out within this setup.

The experiment was carried out over a 3-year period. The results show that:

- The Magoye Ripper could be used feasibly with draft animals commonly available in the northern Burkina (horses and donkeys)
- Yield from ripped land was comparable to yield from Zai pits. With certain crops (such as Maize) ripping

provided higher yields than Zai pits.

- Ripping required 8-10 times less labour than making Zai pits.

The Magoye Ripper was developed by Zambia-based Golden Valley Agriculture Research Trust and ACA Technologies. Both organizations are partners in the WAHARA project. In course of the project, they collected feedback on the Ripper from the Burkinabe farmers who participated in the field experiments. Based on that, they made changes to the design and adapted it further to the harder, drier soils of Northern Burkina. This new version is called the 'Kapandula.' In February 2016, the Burkinabe farmers were provided several Kapandulas to try out in their fields.

Ripping: Building upon the promise

Ripping is a common land preparation method in Zambia. It was adopted and spread there in response to land degradation, increasingly frequent dry spells, labour shortage, and dwindling of livestock that provide animal draft power. Northern Burkina (and indeed many other parts of the country) faces some of these issues perennially.

Data collected over three years from the WAHARA field trials shows that ripping can make significant contributions as Burkina Faso looks to boost its farmers from subsistence to productivity. This insight is an invaluable lead; pursuing it is an opportunity that should not be missed.

The field trials were coordinated by Institut de l'Environnement et de Recherches Agricoles

(INERA)-- Burkina's premier public-sector agriculture research organisation-- with close involvement of local farmers. The data, insights, and capacities generated from the

trials lie with them, which can inform any future efforts to further adapt ripping and spread it more widely in Burkina Faso.

The WAHARA Project

The WAHARA (Water Harvesting in Rainfed Africa) project aims to contribute to a better understanding of the possibilities presented by Water Harvesting by identifying and field-testing promising technologies; assessing the potential of their biophysical, socio-economic and political uptake; and outlining a strategy to promote their scaling-up. While the research project's activities are located in four countries-- Tunisia, Ethiopia, Zambia and Burkina Faso-- the findings and deliverables are pertinent to the broader context of Africa. This has been ensured through the choice of research questions and design of the research methodology.

WAHARA analysed the options and enabling conditions for the spread of WHTs in Africa by identifying key WHTs in each of the four countries and tracing the pathways of their spread. It identified good ideas and bad ideas, effective interventions and unsuccessful projects, various stakeholders and their roles. The picture that emerges reveals upscaling as a multi-level process that takes place horizontally (geographical spreading among one stakeholder group), as well as vertically (spreading across various levels of stakeholder groups). WAHARA research also highlights that the process of upscaling of WHTs is often not driven by governments or NGOs who consider it their responsibility to do extension unto farmers, but unfolds organically through the agency of farmers who constantly try to innovate in an effort to increase their productivity. This document is informed heavily by these two key findings.

WAHARA has a pan-Africa focus, in keeping with the pan-Africa relevance of water harvesting. However, key variables such as biophysical conditions, governance structures, extension systems, technical capacity, and socio-economy vary greatly from country to country. WAHARA research was carried out in Tunisia, Ethiopia, Zambia, and Burkina Faso. An overarching objective behind the framing of research questions and design of research methodologies was to identify biophysical and social elements of water harvesting that are also applicable over the broader region (Africa).

