

SMART AGRICULTURAL TOOLS



The
SMART Centre
Group




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The Water
CHANNEL



Flood-Based Livelihoods
Network Foundation

A man with a beard, wearing a white shirt with orange vertical stripes, is pushing a blue metal handcart on a dirt path. The cart has two large wheels and a handlebar. The background is a dry, dusty landscape.

Introduction

Many agricultural tools improve labour productivity, reduce drudgery and occupational hazards. However, wide distribution of these tools often lack. MetaMeta and the Smart Centre Group (re)develop and promote these tools for small-scale farmers with ample scope for poverty alleviation and inclusive growth. We demonstrate the tools and train the private sector in order to locally produce them and to set up adequate supply chains to ensure high-quality and durable working tools for future generations.

Many work tools have already been successfully ground-validated and made affordable by setting up local production. As agriculture is an observational science, and farmers bring rich and innovative ideas and knowledge to tackle challenges, the introduction and redevelopment of agricultural tools to make the really smart is a continuous process. This document shows just a few of the tools that are being introduced, any additions and/or revisions are more than welcome at:

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The following tools have been developed and successfully implemented in a number of countries. All tools share one most important characteristic, future potential:



Scythe

What

The Scythe is a tool with which harvesting of (dry-stem) crops, grasses and weeds is 4 times as quick as to using sickles. The scythe is a tool that was in use in European countries up until the mid 20th century, and has recently regained the attention through the scythe network.

Why

For many farmers cutting crops with sickles means long hours bent in fields that not uncommonly also harbour snakes or other reptiles. Using scythes means there is a longer distance between from the ground and bending is not required anymore.

How

With a sharp high quality blade attached to a bent iron bar with handles, the user can –by twisting the upper body –cut a way up to 30 cm of plants that stand to the right and in front of him/her (an approximate 120° angle) in one sway.

Information resources:

- Video: <http://scytheconnected.blogspot.com/2016/06/sowing-seeds-for-scythe-revolution>. Html
- Video: <http://www.thewaterchannel.tv/media-gallery/6370-scythe-project-in-india-2016>
- Blog: <http://scytheconnected.blogspot.nl/2016/06/sowing-seeds-for-scythe-revolution.html>

Tree Puller

What

The tree puller is a simple tool with which trees with a stem diameter of up to 5cm (2 inch) and with relatively shallow rooting systems can be uprooted.

Why

The tool eases the effort of uprooting small trees and in Ethiopia may be highly relevant for: (esthetic) urban/ rural public gardening/ roads sides; Coffee plantations (uprooting of old trees); Pastoralist areas for clearing of grazing lands; clearing of invasive species.

How

The tree puller works on the principle of a claw, fulcrum and an arm as lever. The claw is placed around the stem (tree may need to be topped) and by pulling the long arm the tree is uprooted.

Information resources:

- Video: <http://www.thewaterchannel.tv/media-gallery/6388-the-tree-puller>
- Document: Manual prepared by Simon Chevalking

Dual purpose Carrier

What

The dual purpose trolleys made of firmly welded strong iron pipes and having good balance to suit diverse rural terrain and farm conditions can carry liquids such as water or soluble nutrients or materials such as soils, seeds, fertilizers and agricultural produce.

Why

The carrier has good ground clearance and is easy to manoeuvre in rough terrain.



Fodder Chopper



What

The fodder chopper is a hand or electricity driven machine, that can be used in households or at farms to chop dry and fresh fodder. The chopper is easy to operate and maintain and chopping size can be easily adjusted.

Why

The chopper saves a lot of time as compared to cutting fodder by hand.

Information resources:

- Video: <http://www.thewaterchannel.tv/media-gallery/3836-rural-technologies-fodder-chopping-machine>



Milk Churner

What

The Electric Milk Churner is a tool used to extract butter directly from milk.

Why

This tool can help in releasing rural women involved in dairy production from tedious and time-consuming activities, and in return, improving the health and economic outcomes of their communities.

How

There are different models in use; the Pakistani model (see image) has horizontal blades that can be produced and repaired locally.

Costs

Information resources:

- Video: <http://www.thewaterchannel.tv/media-gallery/3494-the-electric-milk-churner>
- Practical note: http://www.spateirrigation.org/wordpress/wpcontent/uploads/PN18_Equipment_ChurnerLQ.pdf

Water Pads



What

A waterpad can be described as a sandwich of hessian, polymers and paper that when placed at the root zone of plants ensures an efficient use of water and nutrients. Only 7 grams of polymers can absorb (or buffer) 1 litre of water turning it into gel. This concentration of polymers placed at the root zone of plants allows the roots to grow into the gel creating an optimal environment for water and nutrient exchange between plant and polymers.

Why

Waterpads can reduce the water and nutrient application between 20-40% (when comparing with conventional drip irrigation) and plant yields can increase between 10 to 20%. Waterpads can also significantly increase the survival rate when transplanting sapplings for reforestation or plantations.

How

The biodegradable waterpad acts as a water and nutrient buffer at the rootzone, which slowly releases water and nutrients to the plant when it needs them. This reduces water and plant nutrient losses in drainage, deep percolation and leaching, and significantly (20% at least) reduces the amount of irrigation water required. The waterpad improves the water availability in plant substrates or soils which leads also to improved yields.



Information resources

• Video:

<http://www.thewaterchannel.tv/features/450-waterproductivity>

<https://vimeo.com/177683746>

Blog: <http://www.thewaterchannel.tv/thewaterblog/409-ropes-and-hopes>



Oil Press



What

The oil press, is an electrical oil extractor machine that extracts oil from different kind of seeds (rapeseed, mustard, sesame, cotton seed, and other similar seeds). It is very popular in rural areas in Pakistan, and is easy to operate, repair and maintain.

Why

The house processing of seeds into high-value oil does not only improve opportunities for households' income, but also reduces the potential losses due to rodents, birds and moulds.

Information resources:

- Video: <http://www.thewaterchannel.tv/media-gallery/3842-rural-technologies-oil-extractor-machine>



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