

Simple mechanization for dug-out ponds construction

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Practical Note



Flood-Based Livelihoods
Network Foundation



Figure 1: Ox-drawn plough is used to soften the soil in the excavation area of a dug-out pond

Digging ponds is a labour demanding activity when there is no access to excavators and lorries. Nevertheless, most small sized (<1000 m³) dug-out ponds in rural areas are dug by hand. Labour is required for digging, for removing the soil and to transport it to the disposal area. If all these activities are done manually, there are also some simple technologies that allow the construction of ponds with the aid of draft animals.

While ox drawn ploughs are readily available in most villages, the ox-drawn scoop and ox-drawn compactor need to be introduced. Luckily, an experienced workshop, can easily build them from scrap metal that is locally available.

The ox-drawn plough is attached to two or three oxen pairs using normal yokes. The area to be excavated is thus softened by ploughing to a depth of 20 - 30 cm. It is important to plan the space around to permit easy turns for the animals.

The softened soil is thus removed with the ox-scoop. To load the scoop the operators simply raise the handles of the device to augment the incidental angle between the soil and the scoop. The forward movement of the animals will then do the rest. Once the scoop is loaded, the handles are lowered again and the scoop will be pulled until the disposal area. To offload the soil, the operators need to raise the handles until the scoop will topple together with its load.

Excavated soil needs to be properly disposed and it is commonly used to build a berm all around the pond. It is important to compact the berm to avoid erosion problems. The process is commonly done with hand-rams. Nevertheless, a simple roll-compactor can be built with second-hand bearings, scrap metal and an old oil drum. The drum is filled with sand and it rotates as it is pulled by the oxen.

Table 1: comparison of tools for dug-out pond construction

Activity	Traditionally	With draft animals aid
Soil softening	Hand digging with hoes, pick-axes and hand chisel	Ox drawn plough
Soil removal	Shovel and buckets	Ox-drawn scoop
Soil compaction (embankments)	Hand compactors	Ox-drawn compactor



Figure 2: An ox-drawn scoop (locally constructed) is used to remove the soil from the excavation area and dispose it where the embankment will be established.



Figure 3: An ox-drawn compactor was built out of an old oil drum and is used to compact the embankments

Colophon

This practical note is prepared by Francesco Sambalino, Eduardo Tovar Lopez and Goodluck Estomih Laizer for the Flood-Based Livelihoods Network.

The Flood-Based Livelihoods Network (FBLN) supports and promotes appropriate programmes and policies to improve flood-based livelihoods systems (FBLS) through a range of interventions, assists in educational development and knowledge-sharing, creates networks and supports the implementation of projects on FBLS.

For more information: www.spate-irrigation.org.



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