

# Excavation Tools for Rural Communities



## List of Tools by Function

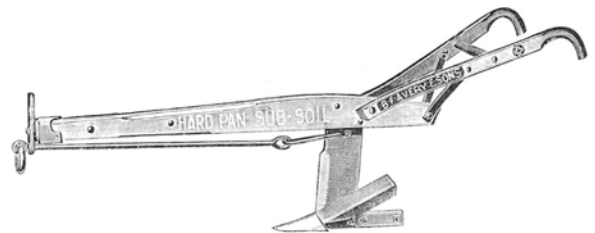
### Soil Loosening Equipment

Before moving soil and grading it into a road or removing it for a pond, it frequently must be loosened. Several tools have been used with animal power to break soil into parts that can be moved, formed, and repacked.

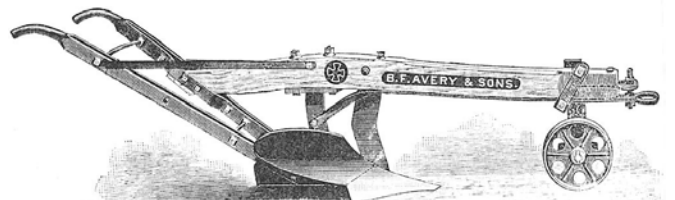
Loosening tools include:



**Ard**



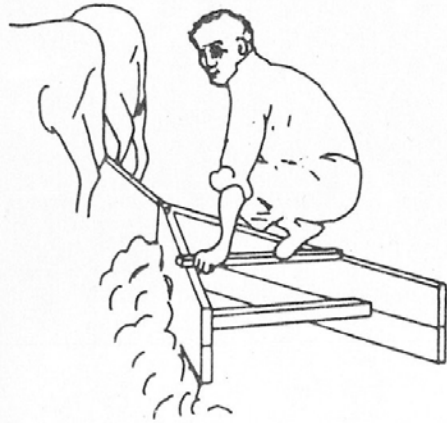
**Ripper w reversible tip**



**Trenching Plow with adjustable beam**



## Tools for Lateral Soil Movement



### Simple V Ridger (FAO)

The simple ridging V-plow described in appropriate technology literature has limited stability and must push soil in both directions more or less equally.

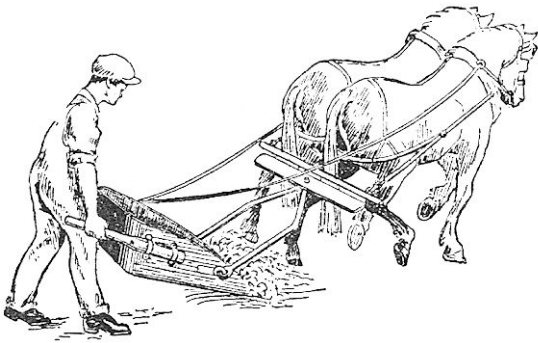


**Martin Ditcher** -- Elongated landslide, keel, and off-set hitch point

The Martin Ditcher appears to be a similar design, but at closer look, it has a couple of significant improvements. These become dramatically apparent as soon as the tool is put to work. It can move soil either left or right at the operators choice. It is very aggressive. The design aspects that permits it to direct soil movement in a single direction are:

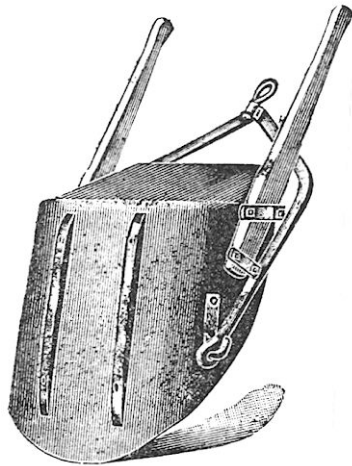
- 1) the stabilizing side is nearly twice as long as the soil moving side with a keel at its tail, and 2)
- 2) the hitch is offset from the center. With these features it works as a wide moldboard plow, rolling soil laterally about 36-48 inches (90-120 cm.).

# Tools for Short Distance Soil Movement

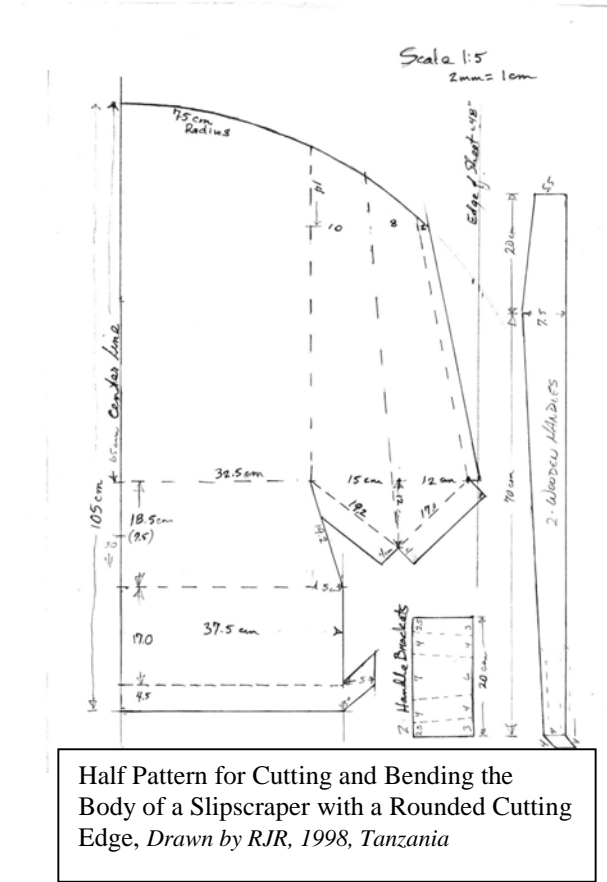


## Simple Slip Scraper

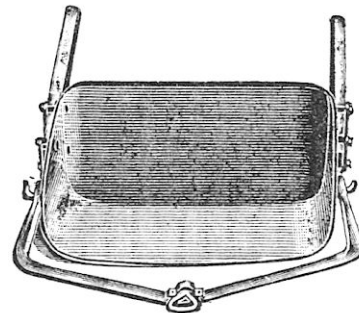
Slip scrapers (or dam scoops) vary in their ability to dig into and load unloosened soil. The types with rounded cutting edges are more aggressive in cutting and easier to handle in loading.



A Slip Scraper with a rounded cutting edge.



Half Pattern for Cutting and Bending the Body of a Slipscraper with a Rounded Cutting Edge, Drawn by RJR, 1998, Tanzania



A Slip Scraper with a flat cutting edge.



## Fresno Scraper

The Fresno is designed for superior unloading of soil. With its flat cutting edge, it is best loaded with loosened soil. It is excellent on the other hand, a gauging a uniform layer of gravel or sand at a desired depth. (See Tillers' TechGuide for making the Fresno Scrapper.)

**Wheeled Scraper,** with lift lever

The wheeled scraper is best for loading and moving soil at an intermediate distance, perhaps 100-300 meters. Historically, extra animals were used to load it (a snatch team) and then just a single pair to pull the load of 2/3s of a cubic yard to the destination.

## Tools for Longer Distance Soil Movement

Gravel wagons



**Dump carts**

Trailers hitched to forecarts

## Tools for Grading and Leveling



**Parallel blade floats**

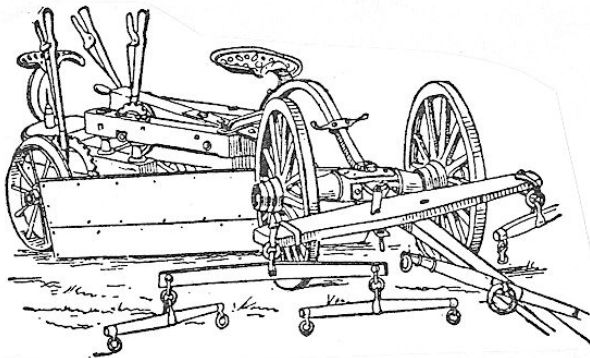
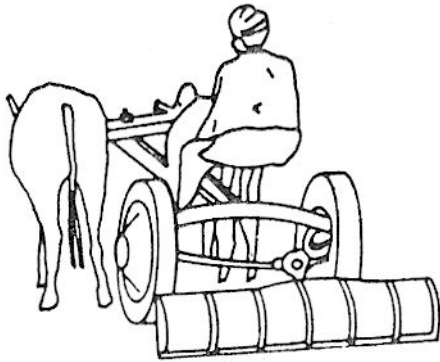


**Non-parallel blade road grader**





Two-wheel graders



Four-wheel road graders

## Earth Moistening Equipment



Water Carts

Drip Irrigation Systems

### • Earth Compaction Equipment

- Animal hooves
- Compacting Rollers

### • Hitching Options

- Four-Ox Evener for added power
- Forecart hitching conventional trailers