Land Leveling

info sheet

What is land leveling?

Land leveling refers to removing the unevenness in land level (sometimes called surface topography) within a field. Unevenness in land level results in uneven water flow and coverage. Fields can be leveled to have no slope (e.g., for flooded rice) or a small slope (to facilitate irrigation water flow and drainage).

Note: There is a difference between landplaning and land leveling. Landplanes smooth the soil surface (images 1 and 2). Land leveling moves more soil from high spots to low spots (images 3 and 4).

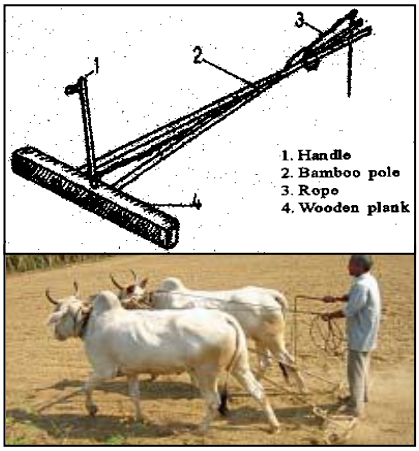

Image 1: Bullock drawn landplane. Source: FAO (1998); Jat (2006).

Why should we level farmland?

Effective land leveling can improve

- crop establishment and uniformity
- crop management (especially irrigation and weed control),
- uniformity of crop maturity, and
- crop quality and yields.

Land leveling can be effective in both irrigated and rain fed environments.

Image 2: Landplane, Dibacco.com

Land leveling on small farms:

Field Preparation: Fields need to be plowed before leveling or smoothing. Before leveling, fields need to be topographically surveyed to determine the cut and fill locations of the field.

Bullock or hand tractor drawn levelers - used on many small farms - do more land smoothing than land leveling. These implements consist of a plank or blade that shifts some soil from higher to the low-lying areas. A person may stand on the plank or a heavy stone can be placed on the plank to increase the amount of soil moved. Fields are often flooded when used for rice.

Image 3: Tractor mounted land leveler. Source: Dept. of Agri. Cooperation, India.

Tractor-mounted levelers consist of a collection bucket connected to a tractor with a hydraulic system that allows raising and lowering of the bucket. The bucket has a sharp cutting blade (that can be replaced as it wears), plus a curved back plate with side wings (image 3). During operation, the blade "cuts" soil in high areas and releases (fills) soil in lower-lying parts of the field. The working depth of the implement is controlled by the hydraulic system of the tractor and depends on bucket size, tractor power and soil conditions. Tractors as small as 30 hp can be used.

Laser levelers more accurately level fields and consist of a tractor, "bucket", laser transmitter and receiver, control panel and the tractor's hydraulic control system. Laser leveling results in more uniform leveling that may not require further leveling for a number of years.

Image 4: Laser Land Leveler. Source: Rickman (2002).

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References: http://www.knowledgebank.irri.org/landprep/index.php/land-leveling-mainmenu-65 and http://www.rwc.cgiar.org/rwc/docs/TechBull/Laser_Leveler.pdf

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