

Animal power equipment at the farm level in The Gambia

by

Sidi M. Jarju, Dawda M. Sarr and Alphu J. Marong

*Soil and Water Management Unit & Agricultural Engineering Unit
Ministry of Agriculture, Banjul, The Gambia*

Abstract

Background information on the use of animal traction in The Gambia is provided. The use of animal-drawn implements has increased greatly since the mid-70s. The types of animal power equipment in use at farm level are described. The multipurpose Sine Hoe toolbars, imported from neighbouring Senegal, are the main implements employed by farmers. The major problems and constraints relating to the use of animal power equipment at field level are discussed and corresponding solutions suggested.

The background of animal traction in The Gambia

Oxenization started in The Gambia in the late 1940s when the *Sutledge* single-mouldboard plow was introduced for demonstration purposes. The first real move from traditional hand cultivation methods started in the 1950s and 1960s, when some farmers started using the *Emcot* ridger, the first single purpose animal-drawn implement to be adopted in The Gambia. The ridger was imported from Britain and consisted of a robust beam and an adjustable double-winged ridging plow. This ridger can be looked upon as the second step of a "mechanical ladder" that represents a mechanization process which allows a progressive change from the use of one type of technology to another. (See diagram). The *Emcot* ridger can be used for other purposes besides ridging. Some farmers in the Western Division where ridge cultivation is still practised use the ridger to till the soil between the

rows of growing cereal crops, such as maize, millet and sorghum. This is in order to bury weeds, consolidate the base of the plants to guard against strong winds and to distribute broadcast fertilizer for more efficient utilization by the plants.

Gambian farmers, with guidance from the extension branch of the Ministry of Agriculture, thus started to follow the mechanization scheme mentioned, but three decades elapsed before the adoption of the multipurpose *Sine Hoe* implement. It is curious that such an implement was not introduced earlier. Instead, during the period from the 1960s to the early 1970s, the *Apolos* and the *Xplos* wheeled toolcarriers with pneumatic tyres were introduced. The toolcarriers were multipurpose implements, imported from Britain. They did not win farmer acceptance because their cost was too high and their components were too heavy.

In 1975/76 the *Sine Hoe* (Houe Sine) implements manufactured in Senegal by SISCOMA were evaluated (Matthews and Pullen, 1976). Through the efforts of Matthews and Pullen, the evaluation of the implements was accomplished and recommendations were made for their adoption of the following equipment:

- Sine Hoe frame, with 250-mm single-mouldboard plow, five-tine cultivator, earthing-up attachment and groundnut lifter.
- Super Eco seeder.

By the late 1970s and early 1980s there was widespread acceptance of the *Sine Hoe* imple-

ments. During these years the staff of the Agricultural Engineering Unit in the Department of Agriculture helped to promote the use of the implements through the extension branch which is responsible for training. The extension branch organized village-based farmer-training programmes. The Agricultural Engineering Unit also provided after-sales services, including the sale of spare parts. Unfortunately, the work of Matthews and Pullen did not motivate research initiatives within the Agriculture Engineering Unit that might have led to an enhanced implement package for use in potential rice-growing ecologies such as the swamp lands.

Types of animal-drawn equipment used in The Gambia

The range of animal-drawn implements in common use is as follows:

- Sine Hoe,
- Emcot Ridger,
- CFOOOP 250-mm mouldboard plow,
- Hoe Occidental,
- Ox cart
- Donkey Cart
- Horse Cart

The number of Emcot ridgers in use at the farm level is declining since these implements are no longer manufactured. The CFOOOP plow is suitable for making high ridges for the control of soil erosion. The Hoe Occidental is a small multipurpose frame to which different soil-contacting parts are attached for plowing and weeding. The CFOOOP plow and the Hoe Occidental are widely used in the Upper River Division of the country. The Sine Hoe implements have been grouped into three packages for groundnuts alone, for groundnuts and cereals, and for groundnuts, cereals and cotton. For cereals and cotton, the operations using animal power are plowing, harrowing, planting and weeding. With groundnuts an additional operation is harvesting (groundnut lifting).

The number of ox carts, donkey carts and horse carts have increased since 1977 when implement packages including these carts were provided to farmers by the Cooperative Union on medium-term loans. Since then donkey carts have greatly increased in popularity by virtue of the fact that donkeys are more readily available, and cost less than oxen or horses, and also the donkey carts themselves are cheaper.

Constraints and possible solutions

Gambian farmers have yet to be convinced that the use of animal-drawn implements can be extended to swamp areas. Trials relating to this were started in the past and abandoned, with no attempts made to reactivate them. The fact that the Sine Hoe implements are currently limited to only upland conditions has become a major constraint to the Government's attempt to increase rice production and thereby save foreign exchange. This has led to the launching of an intensive rice production project involving the smallholder farmer and the use of expensive motorized equipment. This project is currently supported by a foreign donor. Production has been raised above the subsistence level, but it is doubtful whether the income generated so far will sustain this project when it becomes autonomous or will enable the farmer to become self-sufficient. Thus the authors all consider that that the Department of Agriculture should support the enrichment of the Sine Hoe package to allow it to be used for rice production.

Gambian farmers still farm on stumpy land and do not appear to appreciate the benefits that can be derived from destumping land in terms of yield increases and the ease with which cultivations could be carried out. The efficiency of all the implements used for primary and secondary cultivations is greatly reduced

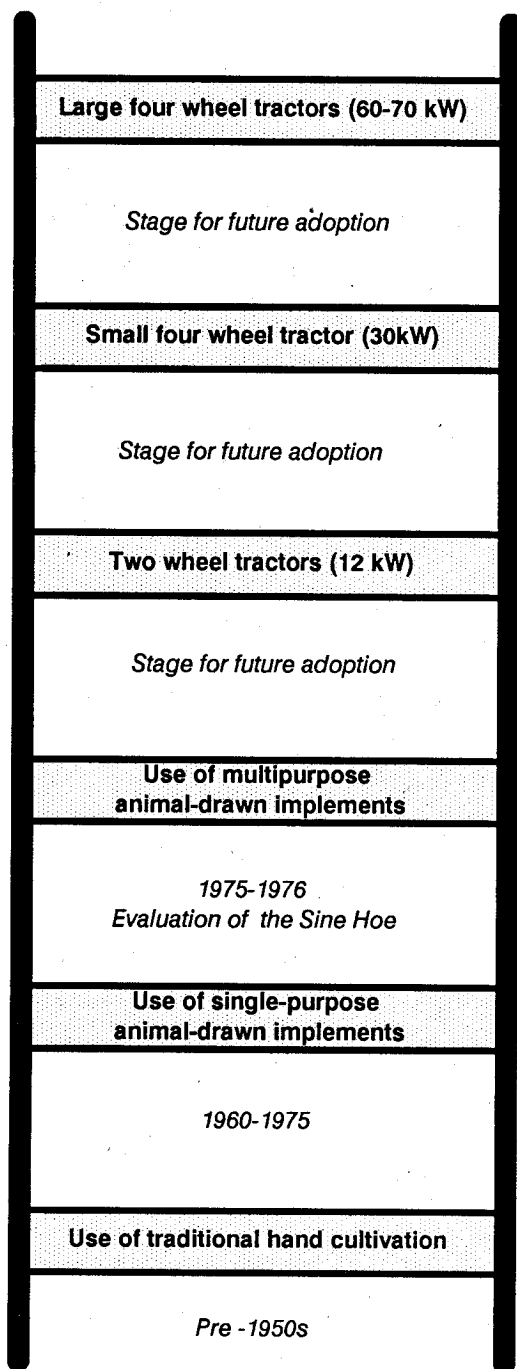


Diagram illustrating the mechanical ladder concept

when used on land that is stumpy for crops cannot be sown in straight lines which in turn make inter-row weeding and subsequent operations difficult. In order to solve this problem the authors suggest that the Extension Unit should introduce a scheme whereby farmers could be encouraged to embark on gradual destumping of their land.

The *Open Kraal System* is still widely practised by herdsmen. This practice is looked upon by farmers as a means of increasing soil fertility. However during the dry season cattle dung is baked by the heat of the sun and becomes very hard. It thus remains on the surface and creates obstructions during planting, for as the wheels of the Super Eco seeder rise over the hard dung, the efficiency of the seeder can be impaired. One solution to this problem would be to encourage market gardening in localities where the open kraal system is practised in order that the dung could be collected and used for manure.

The use of animal-drawn implements has increased production, but this has led to the creation of new bottlenecks. The larger amounts of crops harvested cannot all be processed at the farm level. Post-harvest operations are difficult and are normally undertaken by women. The use of internal combustion engines to power processing machines often involves high costs, and spare-part problems when used at village level. One solution to this problem could be to harness animal power for such operations. Initially a search could be made for existing suitable equipment used elsewhere. Following this, prototypes could be designed,

field-tested and developed provided this does not involve high costs.

Conclusions

It can be seen in the foregoing that there have been both failures and achievements concerning animal traction implements in The Gambia. However, it could be said that, on balance, more has been achieved by the Gambian farmer over the years in that:

- The Sine Hoe has been widely adopted.
- Despite the effects of the drought, production has increased.
- Through the guidance of the extension sector, the gradual mechanization system (mechanical ladder) has been followed. This has avoided the temptation to em-

bark on intensive mechanization projects. More often than not, such capital-intensive technologies have failed in Africa.

The major problems and constraints discussed above still persist. The authors feel wholeheartedly that there is a need for the creation of adaptive research initiatives aimed at broadening the use of the implements available, and also reducing their costs.

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