Animal-drawn implement supply, distribution and services in Malawi

W.F. Kumwenda

Ministry of Agriculture and Irrigation, Chitedze Research Station, P.O Box 158,Lilongwe, Malawi.

Abstract

Despite the availability of labour saving technologies in the country, less than 20% of the smallholder farmers have access to technologies for improving food production and processing. It is recognized that Malawian farmers need to attain food self-sufficiency at national as well as household level, as a way towards sustainable livelihood. To do so, farmers have to shift to improved technologies from total dependence on old and crude manual equipment to produce and process food as well as in rural transport.

This paper reviews the supply and distribution of hand tools and animal-drawn agricultural mechanisation implements and services and identifies areas where action is required.

Introduction

Malawi is an agricultural country with little by way of mineral resources. Agricultural production is derived from the smallholder farmers and the estate sector.

Over 70% of the cultivated area (2.88 million ha) in Malawi is under customary land tenure and is farmed by 1.2 million smallholder farm families with land holdings ranging from 0.5 to 2.5 ha. The estate sector utilises approximately 5% of the cultivated area (0.47 million ha) on 1200 units under the leasehold and freehold tenure systems. Smallholder farmers produce the bulk (80%) of the food crops such as maize, groundnuts pulses, cassava, sorghum, rice, potatoes, sunflower, livestock, wheat, vegetables and fruits. Some limited volume of cash crops such as tobacco, coffee, macadamia, cashew and spices is also grown by smallholder farmers.

The estate sub-sector primarily produces cash crops such as tobacco, sugar, coffee, tea and tree nuts although of late this sub-sector has also gone into production of crops mainly on contract with processors of marketing organisations (Agricultural Science Committee, 1999). Maize is the staple food crop and is the most important crop to the Malawian population occupying 68% of all crop land. Surpluses of maize have been produced in favourable seasons but in recent years production has fluctuated due to unattractive input costs and unfavourable weather conditions.

One of the major constraints faced by the smallholder farmers in Malawi is labour shortage at peak production periods. The country has a unimodal rainfall pattern and timeliness of operations is very crucial. Late or inadequate land preparation with accompanying late planting and weeding have usually resulted in low yields. Hand harvesting of crops and subsequent processing and transport pose additional difficulties and unnecessary losses for farmers. Bucket irrigation is a practiced on a limited scale by a few farmers in selected areas.

The three sources of power in Malawi's agricultural are: Human power, draught animal power (DAP) and motorised power. The commonly used hand tools in the country include axes, hoes and machetes (Table 1). On-farm hand-operated technologies for primary mechanized processing such as shelling, cleaning and grading are scarce while dehulling and milling are carried out by localized units. Eighty five percent of all smallholder farmers exclusively use hand tools for all their agricultural operations particularly in land preparation (Mwinjilo, 1978).

DAP is used by 13% of the smallholder farmers and very little by large estates. There is marked increase in use by the small and medium sized estates and a number of farmers without DAP get the services by hiring from friends and neighbours (Kumwenda, 1987). The use of DAP varies from one area to another depending on the historical background, farmers attitudes and incidences of livestock diseases.

It is estimated that at present there are about 56 258 work oxen, most of them Malawi Zebu type. Of these, only 90% are in use for land preparation and transport. There are about 2 500 donkeys which are used for transport only. Appropriate donkey carts and housing systems are lacking (CODA, 1995). The estimates show that there are 20 920 ox-ploughs, 15 297 ridgers, 743 cultivators and 17 420 ox carts (Table 2).

The percentage of equipment not in use is estimated to be 30% due to a number of reasons which include: lack of spare parts, lack of animals and lack of technical know how of the farmers.

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Table 1: Hand and animal-drawn mechanisation technologies in use in Malawi

(a) Hand tools

Type of Implement	Manufacturer	Distributor	Availability	Comments
Hand Hoe	Agrimal	Chain stores	Readily available	Every family has one
Axe	Agrimal	Chain stores	Readily available	Every family has one
Machete	Agrimal	Chain stores	Readily available	Every family has one
Knapsack sprayer	Agrimal	ADMARC	Scarce	Spare parts limits wider usage

(b) Animal-drawn implements

Type of implement	Manufacturer	Distributor	Availability	Comments
Mouldboard plough	Agrimal	Chipiku + press hardware	Limited to urban centres	Cost is too high, distribution is poor especially spare parts
Ridger	Agrimal	Chipiku + press hardware	Limited to urban centres	Cost is too high, distribution is poor especially spare parts
Cultivator	Agrimal	Chipiku + press hardware	Limited to urban centres	Cost is too high, distribution is poor especially spare parts
Groundnut lifter	Agrimal	Chipiku + press hardware	Limited to urban centres	Cost is too high, distribution is poor especially spares
Ripper	Magoye-Zambia	Government projects	Scarce	Not popularized yet
Dam Scoop	Bain-Zimbabwe	Government projects	Scarce	Not popularized yet

c) Rural transport

Type of implement	Manufacturer	Distributor	Availability	Comments
Ox-carts	Petroleum services	ADMARC, MRFC	Readily available	Extensively used
Wheelbarrows	Brown+Clapperton	ADMARC, MRFC	Readily available	Limited uses for hire
Handcarts	Rural artisans	Rural artisans	Scarce	Limited use in urban centres by vendors
Bicycles	India	Indian Traders	Readily available	extensively used by traders
Sledge	Rural farmers	Farmers	Scarce	Discouraged by environmentalist

Importance of mechanisation:

Agricultural mechanisation involves the use of hand tools, animal-drawn implements and motorised machines to improve the efficiency of human time and labour. The advantages of agricultural mechanisation include:-

a) more timely and better cultivation, facilitates water conservation, good seedbed preparation and early planting in order to take advantage of the rain season peaks;
b) to enable reduced tillage and residue management, improve infiltration, conserve organic matter and control weeds;

c) to eliminate the fallow period and increase crop intensities;
d) to reduce production and harvest losses;
e) to save cost of labour in the face of rising wages;
f) to reduce human drudgery.

Various agricultural technologies, which exist in Malawi, are summarized in Table 3.

Agricultural machinery manufacturing industry

There are two broad categories of manufacturers of agricultural hand tools, animal drawn equipment and machinery in Malawi. These include:

Large commercial manufacturers and rural artisans:

- one medium scale production unit located in Blantyre which produces simple hand tools and animal-drawn cultivation equipment using continuos-flow production methods;
- several small or medium scale production units and specialist machine shops which undertake fabrication and assembly of equipment and machines using batch production methods. These are mainly located in the two major urban centres of Lilongwe and Blantyre;
- numerous artisanal craft and blacksmith workshops operating in rural townships such as Salima, Kasungu, Blantyre and others.

Commercial manufacturers

Chillington Agrimal Limited, located in Blantyre, is the largest manufacturer of hand and animal-drawn equipment in Malawi. The domestic market alone has not been sufficient or reliable to take all Agrimal's production. In the mid 1980s Agrimal reportedly sold one million hoes in Malawi. In 1992 this fell to 300 000, although the farmers reported difficulty obtaining Agrimal hoes in some rural markets. The break-even capacity is estimated at 400 000 hoes per year. Agrimal's strategy is to specialise in order to achieve economies of scale by satisfying a regional demand with products which meet international quality standards. This requires attention to quality control and careful supply management for the domestic and export markets.

Petroleum services is the second major manufacturer of agricultural equipment in Malawi with workshops in Blantyre and Lilongwe. The product range includes hand tools, animal-drawn equipment and simple hand operated machinery in addition to general engineering products. The company is the biggest single producer of ox carts; about 9 000 to date and up to 1000 at a time on order for ADMARC.

A number of general fabrication and engineering companies, such as Brown and Clapperton, and Plumbing and Engineering, engage in agricultural equipment manufacturing and assembly, especially for the tobacco and tea sectors, and for post harvest processing equipment. They do so when market opportunities exist, but do not rely entirely on the agricultural sector for their business.

These commercial manufacturers face a number of common problems. They are constrained by a relatively small, fragmented and seasonal market for agricultural tools and equipment, and uncertain or expensive supplies of imported materials. Some manufacturers have old or limited production facilities, which limit product range or quality assurance. Links with institutions which support farmers, such as extension, research and credit, are tenuous. Some argue that high duties on imported raw materials and components discourage local manufacturing and encourage the importation of finished goods.

Rural artisans

Rural artisans include blacksmiths, carpenters, tinsmiths and metalworkers. No reliable estimates of establishment and production are available. Farmers reported that village-based artisans were at least to be found within the boundary of each rural development project. Unsubstantiated estimates put hand tool output at over 300 000 units per year and ox carts in excess of 500. Material supplies for many hand tools and simple equipment are from scrap yards.

Workshop facilities, skill levels, and product range vary considerably. Artisans often switch production between farm and household goods according to local, often seasonal, demand. Many proprietors have either previously worked with another artisan or previously gained engineering skills in the formal sector. More recently a number of artisans have received training through the Salima Rural Trade school or the Malawian Enterprise Development Issue (MEDI).

A rapid survey of artisan workshops identified the following constraints:

- they have a limited and seasonal market;
- they possess limited workshop skills, tools, and business acumen;
- they experience difficulties in acquiring or financing raw materials and have a limited product range.

Table 2: Work oxen and animal-drawn implements in selected areas (1995)

Area		Work Oxen	Ploughs	Ridgers	Cultivators	Ox-Cart
Kasungu	U	11 377	3 281	4 386	15	4 169
	N	485	622	1 238	33	1 183
	T	11 862	3 903	5 624	.48	5 352
Karonga	U	8 899	3 727	471	36	504
	N	0	638	0	14	0
	T	8 899	4 365	471	50	504
Blantyre	U	414	73	93	22	191
	N	0	75	33	0	48
	T	414	148	123	22	239
Machinga*	U	770	582	376	58	508
	N	18	59	54	16	53
	T	788	641	430	74	561
Mzuzu	U	17 994	7 836	5 545	106	1 701
	N	500	862	492	45	180
	T	18 494	8 698	6 037	151	1 881
Shire*Valley	U	0	0	0	0	0
	N	0	0	0	0	0
	T	1 260	458	189	16	631
Lilongwe	U	11 812	1 117	975	64	7 290
	N	849	622	570	127	145
	T	12 661	1 739	1 545	291	7 436
Salima	U	1 280	905	812	77	779
	N	600	63	63	5	37
	T	1 880	968	875	82	816
Malawi	T	56 285	20 920	15 297	734	17 420

Source: CODA 1995

Key: U: In use; N: Not in use; T: Total

Table 3: Mechanisation technologies in small farms and medium estates

Farm Sector	Smallholder	Smallholder and small Estate*	Medium Estates
Dominant technology	Hand	Hand/DAP	Tractor
Operation			
Land clearing	axe, panga, pick mattock, hoes, saw	as for hand	as for hand
Land preparation	hoe, panga	hoes, panga or ox plough and ridge, power tiller on irrigated rice	tractor disc ploughfollowed by hand or tractor ridging
Seeding	hand, stick	hand, stick	hand, stick
Fertiliser application	hand, stick	hand, stick	hand, stick
Pest/disease control	hand, knap-sack on tobacco, cotton, rice, veg.bird scare	as for hand	as for hand
Weeding	Hoe	hoe, limited use of DAP cultivator	as for hand
Harvest	hand, knives, sickles	as for hand	as for hand
Processing	mortar and pestile, maize shellers, malls and grinders	as for hand	as for hand, tobaccoprocesses, plus engine powered rice dehullers
Transport head porterage bucket, hand cart	ox carts	hand, ox cart or tractor	
Water delivery	bucket, watering can	as for hand + ox cart	small pumps

*Some land preparation by power tillers on some irrigation schemes Tractors used for transport on coffee, tea and sugar smallholder authorities

Distribution

Most of the distributors of farm machinery equipment are large chain stores with their headquarters based in Blantyre in the Southern part of the country. These manufacturers are poorly supplied with information on the demand of implements. Because of this they end up sending wrong implements or spare parts to areas where they are not needed. Sometimes the implements are distributed at the time when farmers do not have money to buy them so they have to be kept until the next marketing season. This causes frustration of the distributors because the products do not sell quickly and to the farmers for not having what they want.

Distributors are not familiar with the implements and spare parts they are supposed to sell. This creates problems of ordering the wrong implements from manufacturers. An improvement on the information supply system between the farmers and the suppliers and distributors could greatly enhance the supply of farm machinery implements.

Material supplies

Steel products are available from specialist steel procurement agents and stockists who keep a range of products. They import mainly from South Africa and Zimbabwe. Items are subject to import duties which range from 10-25% on the cost, insurance and freight (CIF) and import surtax of 10%.

Imports increased significantly in the last four years following economic liberalisation. More recently, reliability of supplies, especially from Zimbabwe, has been reduced due to production and transport problems.

Commercial manufacturers often act as intermediaries in the supply of steel to artisans in the three regions.

Ancillary industries

The Malawi Iron and Steel Corporation (MISCOR) was the supplier of ferrous castings. It supplied components for Agrimal DAP equipment, irrigation pump castings, pipes and fittings for post harvest machinery. This company (MISCOR) has merged with Agrimal and continues to supply its products to its customers. Existing scrap recovery and foundry facilities are in need of rehabilitation. A recent market analysis identified the potential annual demand for MISCOR products of about 900 tonnes of ferrous casting, 200 tonnes of non-ferrous castings and about 3250 tonnes of other iron products.

MISCOR, with assistance from the Malawi Development Corporation and UNIDO, identified a rehabilitation project, which included the installation of an electric induction furnace and the rehabilitation of foundry facilities. These improvements enabled MISCOR to meet the demands for quality cast products for the manufacture of agricultural equipment.

Enhancements and development action

The agricultural manufacturing sector has a number of strengths upon which to build. With respect to commercial manufacturers, there is still an existing capability in specialist equipment manufacturing and general fabrication. Several of these organisations have established international links. They have shown an ability to meet local needs, such as in the tea and tobacco sectors, where there is a market demand. With the exception of hand tools, however, limited demand from smallholder farmers have restricted the involvement of the commercial manufacturers in smallholder agriculture.

There exists an ambitious, albeit fragile, artisan sector serving the limited needs of the smallholder farmer. There are few organisations who are involved in artisan training and management for small enterprise. These represent a skills base on which to build.

A number of actions can be identified which aim at overcoming the constraints and exploiting the opportunities facing the manufacturer sector. These include a review of Government policy as it affects the sector, the selected upgrading of existing small scale enterprises, assistance to the ancillary metal working industry, providing industrial extension support, and promoting closer links between farmers, extension and research agents, and manufacturers.

The key to sustained agricultural machinery manufacturing development is the growth of demand for engineering inputs in the estate and smallholder sectors. In this respect, the growth in manufacturing capabilities is tied to the prosperity of those engaged in agriculture, as determined by the success of measures to achieve the targets of improved productivity and diversity.

Importers of finished goods

Agricultural machinery is imported through several franchised import agents who also act as franchise distributors. A number of companies act as importers and franchise agents for other agricultural equipment, particularly for stationary engines, irrigation equipment, and post harvest machinery.

Import quantities and values are difficult to determine precisely and at present individual companies are reluctant to divulge sales data. The volume of trade

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has risen substantially recently, reflecting the effects of foreign exchange liberalisation.

Support actions

For the most part, the local agricultural machinery manufacturing industry is capable of meeting the needs for hand tools, simple machinery, and DAP equipment. The industry could benefit, however, from selected improvement in production facilities. Importers and franchise agents are equipped to meet the need of commercial farmers of sophisticated machinery such as tractors. Sometimes there are shortcomings on the supply, distribution and servicing of tools and equipment for smallholders and the smaller estates. In this respect, there is a need to enhance the role of local artisans and workshops.

Conclusion

Agricultural production and rural transport require power. Mechanisation is a powerful tool in achieving sustainable agricultural production because it enhances human capacity with the potential users or beneficiaries being men, women and children. Draught animal power is a simple technology which is within the reach of many smallholder farmers. Even on the estate DAP can play a major role in enhancing transport. There is still room for improvement of this technology through better distribution, supply and services to the farmers.

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