WETLAND DEVELOPMENT AND MANAGEMENT IN MALAWI[1]

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1. INTRODUCTION

Wetlands in Malawi, characterised by hydromorphic soils, and grass and sedge growth throughout the year are called *dambos.* Topographically *dambos* are usually broad, gentle sloping valleys occurring in the catchment area of Malawi's main rivers. *Dambo* soils are waterlogged at or near the surface for a large part of the year. These hydromorphic soils have a high watertable and are poorly drained resulting in poor aeration. They vary from coarse sands to heavy clays with a soil reaction ranging from acid to alkaline. Large variations also occur in the nutrient status and the structural stability of *dambo* soils. Vegetation, grass and sedge, sometimes shrubs or trees, grow even during the driest months of the year.

The World Bank (1987) estimates that *dambos* form about 12% (259,000 hectares) of the total land area available for cultivation in Malawi. The *dambo* area comprises about 31,000 hectares (ha) used for grazing (Arup-Atkins International Ltd, 1988), 50,000 ha under rice production (Calbro, 1989), 700 small dams (Hunting Technical Services, 1986), and an unknown area used for vegetable growing. Most of the wetland area is uncultivated (approximately 178,000 ha) and possibly surplus land. These areas are too wet to grow crops or graze, and as a result are left to natural vegetation. However, with proper drainage and flood control facilities, wetlands could contribute positively towards national crop and livestock production goals.

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Some of the 'surplus' *dambo* land is already used for scattered smallholder vegetable gardens, and the 700 small dams, mainly constructed for watering tobacco nurseries. However, a large proportion of this unaccounted land appears to remain unutilised. Land use data seem to indicate that *dambos* are grossly under-utilised. Moore et al (1987) estimated irrigation potential in Malawi at 290,000 ha in total, while presently only 16,000 ha are under modern irrigation.

There are three types of land tenure in the *dambos:*

(a) Public Land Tenure, where land belongs to the government. The 3200 ha of rice irrigation schemes established by the government in the *dambos* are under this tenurial arrangement;

(b) Traditional Land Tenure, under the rice self-help irrigation schemes;

(c) Traditional Land Tenure - under communal grazing, most of the land is under this tenurial arrangement both at intra-village and inter-village levels, owned and used communally. A range of uses is made of this land, including livestock grazing, crop production (e.g. vegetables), tobacco nurseries, domestic and livestock water supplies, forage for stall-fed cattle, and the provision of materials such as clay for pots, building sand and thatching grass.

The traditional customary ownership of wetlands causes problems where animals (cattle, goats and sheep) are raised. Immediately after harvest of crops (May to August), crop residues are left for communal grazing by livestock, supplemented by *dambo* grazing as the dry season advances. *Dambo* grazing becomes extremely important from September to November, when almost all the crop residues are depleted. Erosion problems have occurred in some cases due to the uncontrolled, high stocking densities. The customary land ownership and livestock systems do not encourage development of improved pastures on the *dambos,* and facilitate fast spread of animal diseases.

Any changes in management of these wetlands (e.g. fencing, fertilising, pasture seeding, development of irrigation schemes, etc), could result in an upheaval in traditional systems of *dambo* utilisation. It is therefore important that any management changes must be agreed upon by the community using the wetland.

2. DEVELOPMENT OF IRRIGATION SCHEMES AND FARMER PARTICIPATION

The development of irrigation schemes in *dambos* can be categorised under two types:

- Government-supported irrigation schemes on public tenure;
- Self-help irrigation schemes on customary traditional tenure.

Most schemes are located on the shores of Lake Malawi, Lake Chirwa area, the Phalombe plain, and the Shire Valley. They are almost exclusively rice schemes, although farmers in self-help schemes occasionally grow either vegetables or winter maize, plus pulses or sweet potatoes.

Presently there are sixteen government-run smallholder irrigation schemes commanding an area of 3200 ha. They were developed between 1968 and 1976, the land being turned under public tenure. The main objectives of the government schemes were to settle farmers and to increase rice production for domestic and export markets. The government schemes are managed, operated, maintained and rehabilitated by the Ministry of Agriculture (Departments of Agriculture and Irrigation). The development cost of these schemes ranged from MK (Malawi Kwacha) 15,000 to MK 20,000[3] per ha, and the annual maintenance cost is about MK 300 per ha.

In areas where irrigation schemes have been developed and land is public, farmers were not allowed to participate in planning, design and construction. Therefore, they are reluctant to participate in the operation and maintenance of the irrigation schemes. Farmers feel that production is insecure on this public land and are not prepared to participate in the scheme's activities.

Realising that this public land, top-down approach is a non-starter, the government is now encouraging the development of self-help irrigation schemes, utilising a participatory approach which involves beneficiaries. Land is left under the traditional customary tenure system so farmers do not face the insecurity and threat of eviction. Farmers participate in the designing, construction, operation and maintenance of the irrigation schemes. The public-land approach has proved expensive both in terms of capital and recurrent expenditure. The development of self-help irrigation

[3] Present exchange rate: 2.79 Malawi Kwacha = US$ 1

schemes, which require farmer participation as a prerequisite, needs less material and administrative support from the government. Participation of farmers in the construction of the self-help irrigation schemes reduces the capital investment to MK 3000 ha on the part of the government; farmers excavate the canals and drains, provide labour to build structures, and provide stones, sand and mould bricks. They do not make any cash contribution. Recurrent costs borne by the government are reduced to almost zero.

Under this system land is rarely withdrawn, only in cases of serious neglect or misbehaviour. It appears that even though the farmers do not have legal ownership of the land, they consider it as their own, because of the social stability of the system. Table 1 compares the relative advantages and disadvantages of self-help and government-supported irrigation schemes.

3. LABOUR

Labour issues are more relevant to the irrigation schemes, where land has been allocated to individuals than to the communally grazed wetlands. Many farmers face labour problems in the wet season due to the high labour demand of rice production. Their labour has to be divided between the rice schemes in wetlands and their upland gardens. This problem is aggravated by the fact that farmers rely on the use of the simple hoe for land preparation. Work oxen are not extensively used for any cultivation operations. Labour conflicts do not exist in the dry season because crops are not grown in upland areas at this time.

4. MARKETING

The Agricultural Development and Marketing Corporation (ADMARC) is the main channel for smallholder produce in Malawi. The Corporation is charged with the responsibility of purchasing all the smallholder produce as a residual buyer. However, government liberalisation of the market in 1987 means that now private traders play a leading role in buying farmers' produce in rural areas. Farmers prefer to sell to private traders, who offer better prices. In 1989/90, farmers sold paddy rice at 30 tambala/kg (US$ 0.12 kg) and 45 tambala/kg (US$ 0.18 kg) to ADMARC and private traders respectively (Calbro, 1989). Farmers obtain a premium price if they process the rice.

Table 1: Comparison of Self-Help and Government-Supported Irrigation Schemes

	Parameter	*Government*	*Self-Help*
1.	cost of development to be borne by government	high	low
2.	cost of operation and maintenance to be borne by government	high	low - zero
3.	training required for farmers in maintenance and operation	low	high
4.	training required for staff in maintenance and operation	high	low
5.	land tenure problems	high	low
6.	support for the scheme by local farmers	low	high
7.	present and future donor support	low	high
8.	ownership of the scheme by farmers	none	wholly owned by farmers
9.	distribution of the schemes nation-wide	low	high
10.	vulnerability	low	high

Source: C P Mzembe (1990)

However, due to lack of finance and the scale private traders are able to operate on, they fail to compete effectively with ADMARC throughout the marketing season. As a result, most paddy is finally bought by ADMARC at the government's bottom set price. Support to private traders as loans, is required if competition with ADMARC is to be effective, increasing paddy prices to the farmer and encouraging increased production.

Another problem related to marketing is transport. Farmers do not use oxen and ox-carts extensively and do not have transport to carry their produce from the field to the house, and then to the market place. The Smallholder Agricultural Credit Administration (SACA) offers medium term loan facilities to encourage use of ox-carts for product transportation.

5. PROBLEMS TO BE ADDRESSED IN SELF-HELP IRRIGATION SCHEMES

The biggest problem to be addressed in self-help schemes is the operation and maintenance of the schemes after construction is completed. For a sustainable development programme, it is therefore important to:

(a) Provide the beneficiaries with good quality and sufficient training in the operation and maintenance of irrigation schemes;

(b) Create a fund, through user contributions, for purchase of maintenance materials such as bricks and cement. To achieve this each self-help irrigation scheme should develop its own by-laws, specific to the scheme to address its particular problems. A fund contribution clause must be included. Extension and irrigation staff should help and advise on the development of such by-laws.

(c) Provide support for emergency needs, e.g. if the scheme has been washed away. In such a case, both government and farmers should be involved in the planning and rehabilitation of the scheme.

The government intends to develop 1000 ha of self-help irrigation schemes per year in the wetlands from 1991. It is expected that 5000 ha will have been developed by the end of 1996. To achieve this target the government has decentralised its irrigation services into eight Agricultural Development Divisions (ADDs), roughly representing eight ecological areas. The staffing structure and staff training provisions of the Irrigation Department are now under review by the government. Presently staff training is given in irrigation engineering, irrigation agronomy, irrigation extension, sociology, agro-meteorology, mechanical engineering, surveying and draughtsmanship.

Self-help irrigation goals require the mobilisation of smallholders in development; this cannot be achieved by a top-down bureaucracy. The government have to create a local level political infrastructure and

institutions. The principal mobilisers of farmers towards the development of self-help irrigation schemes are party officials, village headmen, chiefs and local-level government personnel, such as the community development assistance and agricultural extension workers.

6. INSTITUTIONAL SUPPORT TO WETLAND DEVELOPMENT

The government's agencies involved in wetland development are the Department of Irrigation, Agriculture (Extension), Animal Health and Industry, Smallholder Agricultural Credit Administration, and Fisheries. At the intra-ministerial level, the following institutions are important; Water Department, Economic Planning and Development Division, Health, Community Services, and Personnel Management and Training.

The government's role is to formulate development policies in line with both the local and international environment. Non-governmental organisations (NGOs) are not involved in the development of wetlands.

The role of donors is to support the projects with funds and technical assistance. Donors have been receptive to the self-help approach in the development of irrigation schemes. The funds provided are used for the procurement of materials, such as cement, construction of flood protection bunds, and services such as training. The farmers provide local materials (big stones, bricks, sand) and labour for canal and drain excavation.

7. NATIONAL PRIORITIES AND FUTURE PROSPECTS FOR WETLAND DEVELOPMENT

There appear to be unutilised areas in *dambos* suitable for irrigation, fisheries or pasture development. The decision on the type of development should be made by the beneficiaries themselves, with government officials acting as trainers and advisers. The national policy on wetland development is to encourage irrigation schemes on a self-help basis where beneficiary farmers participate in the planning, development, operation and maintenance of the schemes. This will, hopefully, avoid potential conflict between any current unknown or under-estimated land uses, and new developments. It is hoped that donors will assist the establishment of self-help projects, including training.

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