

ORGANISATION AND MANAGEMENT OF SMALL-HOLDER  
IRRIGATION IN ZIMBABWE: AN OVERVIEW.\*

by

Mandivamba Rukuni\*\*

Department of Land Management  
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Department of Land Management,  
University of Zimbabwe,  
P.O. Box MP 167  
Mount Pleasant,  
Harare.  
Zimbabwe.

\*\* Lecturer, Agricultural Economics.

\* Views expressed in this paper, are the author's.  
Comments are welcome.

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## SUMMARY

This paper discusses the organisation and management of small-holder irrigation in Zimbabwe. Government and parastatal organisations involved are discussed and so are the national goals of small-holder irrigation development. Management is examined at irrigation scheme level to show the role of farmer organisations. A brief historical background on small-holder irrigation development is provided; land tenure and water rights are discussed. The government heavily subsidizes small-holder schemes and the issue of cost recovery is discussed.

## INTRODUCTION

Zimbabwe has an estimated 143 000 hectares of land under irrigation (Table 1). Most of this area is farmed by large scale private commercial farmers who control approximately 90 000 hectares of irrigated land. Large plantation estate companies irrigate about 304000 ha. of land. Small scale peasant farmers have about 5 500 ha of land developed for their direct use in Communal lands of Zimbabwe.

Land in Zimbabwe is farmed under two main land tenure systems:-

- a) traditional tenure in areas known as Communal Lands farmed by small-holder black farmers,
- b) free-hold tenure in areas known as Commercial Farming Areas predominately farmed by large-scale, mainly white farmers.

In total, about 6 000 peasant farmers occupy 81 irrigation schemes in the Communal Lands. The range of irrigated holdings is between 0,1 and 2 hectares.

### NATIONAL GOALS OF SMALL-HOLDER IRRIGATION DEVELOPMENT

The major objective of irrigation development in Communal Lands include food security, creation of employment, increase in agricultural production, saving and earning foreign currency and serving as a vehicle for spreading new technology among farmers (MLRRD, 1983).

Some of the irrigation schemes are located in grain deficit areas where drought may be as frequent as four to five years. In these areas, the irrigation schemes serve as a means of food security. This strategy is justified on the grounds that other forms of drought relief are less efficient and more expensive.

TABLE 1

Area under irrigation by type : Zimbabwe

<u>Type</u>	<u>Hectares</u>
Private Commercial farms	90 000
Large Company Estates	30 400
Commercial Settler	11 500
Communal lands : ARDA estates and settlers	6 000
Communal lands : DERUDE schemes	4 400
Communal lands : private	700
	<hr/>
	143 000
	<hr/>

Source : U.S.A.I.D. (1982)

Other schemes are viewed as vehicles to increase agricultural production of both food and industrial crops. The objective is to grow crops to save foreign exchange through import substitution (for example, wheat) or as net earners of foreign exchange (for example, cotton). These schemes are expected to create employment for rural people, improve their nutritional status and to be a vehicle for introducing improved agricultural technologies. Where there is high population levels and consequent pressure of land resources, irrigation schemes are expected to enable the intensive settlement of farmers.

#### GOVERNMENTAL AND PARASTATAL ORGANISATIONS INVOLVED IN SMALL-HOLDER IRRIGATION DEVELOPMENT

Three government departments belonging to three ministries, and one parastatal organisation are involved in small-holder irrigation development in Communal Lands. The government departments are:

- a) The Department of Rural Development (DERUDE) in the Ministry of Lands, Resettlement and Rural Development (MLRRD).
- b) The Department of Agricultural Technical Extension Services (AGRITEX) in the Ministry of Agriculture (MOA)
- c) The Department of Water Development (DWD) in the Ministry of Water Resources and Development (MWRD).

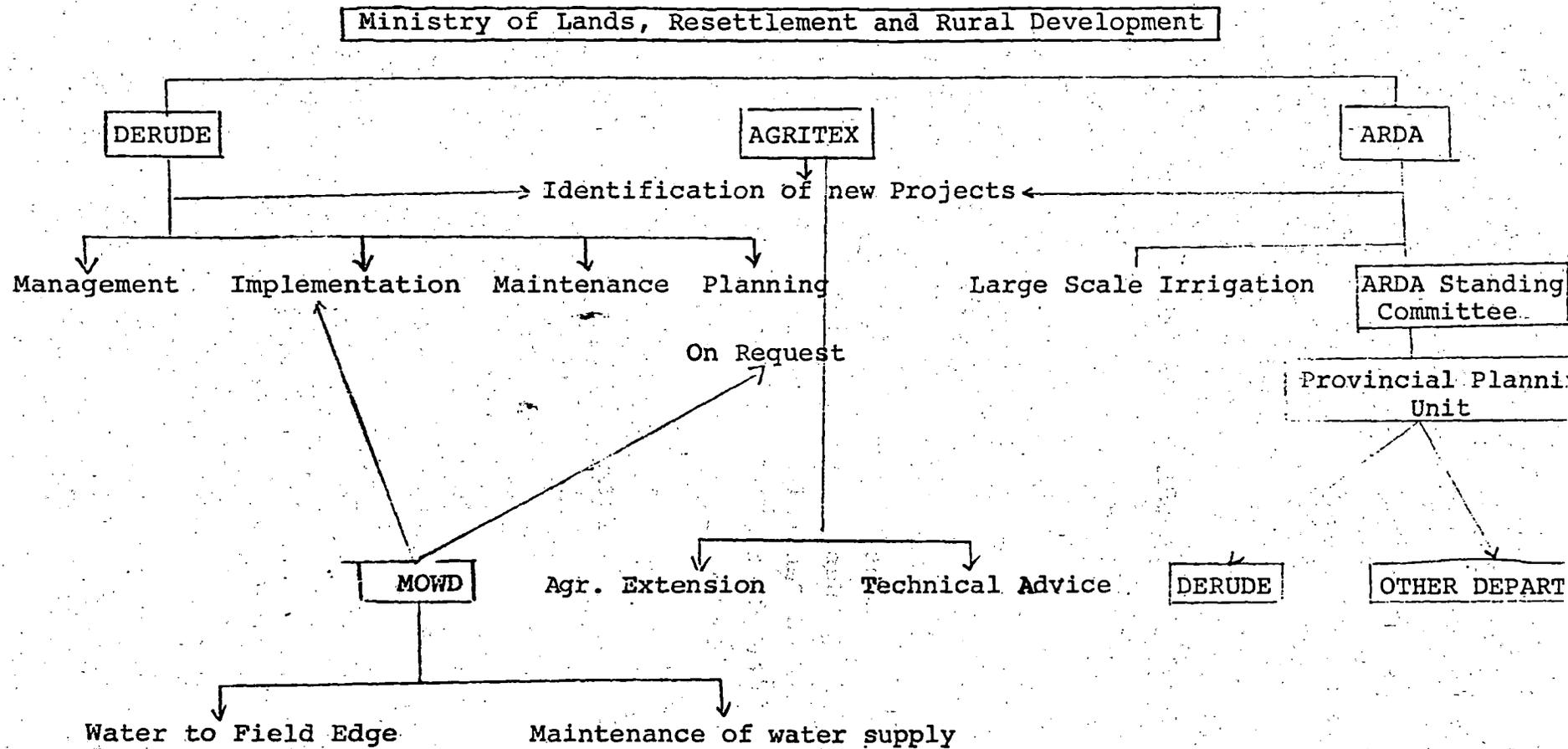
The parastatal organisation is the Agricultural and Rural Development Authority (ARDA), reporting to MLRRD. (Fig. I).

DERUDE and ARDA are the two organisations with the mandate to construct irrigation schemes in Communal Lands. ARDA has the responsibility for larger schemes over 500 hectares, whilst DERUDE concentrates on the smaller schemes. AGRITEX has the role of providing agricultural extension services on the DERUDE managed schemes. ARDA provides both management and extension services on their schemes.

Fig. 1

ZIMBABWE

ORGANIZATIONAL STRUCTURE : SMALL-HOLDER IRRIGATION



Source: Derived from Chief Irrigation Officer, MLRRD.

Table 2

DERUDE Irrigation schemes in Communal Lands

<u>Province</u>	<u>Number of Schemes</u>	<u>Area (ha)</u>	<u>Number of Plot Holders</u>
Manicaland	11	2 189	2 149
Matebeland South	18	1 161	1 173
Mashonaland West	1	5	16
Mashonaland Central	5	48	-
Matebeland North	8	79	220
Masvingo Province	15	418	1 062
Midlands	14	369	1 205
TOTALS	<u>72</u>	<u>4 269</u>	<u>5 825</u>

Source : Derived from DERUDE (1983)

Table 3

ARDA irrigation schemes in Communal Lands

<u>Province</u>	<u>No. of Schemes</u>	<u>Core Estate (ha)</u>	<u>Settlers (ha)</u>	<u>Total (ha)</u>	<u>No. of Settlers</u>
Manicaland	3	2 230	400	2 630	117
Matebeleland South	2	509	241	750	322
Mashonaland West	1	810	120	930	90
Mashonaland Central	2	810	-	810	-
Matebeland North	1	200	-	250	-
-	-	-	-	-	-
-	9	4 609	761	5 370	529
-	-	-	-	-	-

Source : Compiled from various sources, ARDA

There are, in total, 72 DERUDE schemes totalling 4 269 hectares farmed by 825 families (Table 2) ARDA has 9 schemes totalling 5 370 ha, of which 761 ha are farmed by 529 settler farm families. The rest of the 4 609 ha are ARDA 'core estates' farmed on a state farm basis. (Table 3).

The MWRD works in conjunction with DERUDE and ARDA and is responsible for water supply to field edge for these schemes. MWRD is responsible for building dams, water pump stations, main supply lines, canals and the maintenance of all works to field edge.

A few other organisations provide support services to small-holder irrigation schemes. The Department of Co-operative Development (DCD) in MLRRD, is responsible for promoting co-operatives for supply of agricultural inputs and the marketing of agricultural produce. The Agricultural Finance Corporation (A.F.C.) is a parastatal body of MOA. The A.F.C. provides seasonal short-term loans for irrigation farmers. In some cases the A.F.C. gives medium term loans for the purchase of farm equipment.

The Department of Research and Specialist Services (MOA) carries out soil surveys and assess irrigability of soils on proposed sites.

The co-ordination of the various organisations involved in irrigation development and management is a matter undergoing review in Zimbabwe. At present, there is no national co-ordinating body. There are proposals for a National Agricultural and Rural Development Co-ordinating Committee (N.A.R.D.C.C.) composed of representatives from different government ministries involved in agriculture and rural development. NARDCC would assist MLRRD in co-ordinating and directing irrigation development. It is proposed that projects will be brought to the NARDCC for consideration and ratification prior to implementation. This will give the opportunity for all affected ministries to comment on aspects of their responsibilities.

At present, an ARDA Standing Committee which includes representatives from the appropriate government ministries has the responsibility for co-ordinating irrigation development.

#### PRODUCTION OF SMALL-HOLDER IRRIGATION SCHEMES

Maize is the most important irrigation crop grown on all small-holder irrigation schemes. An average of about 2 031 ha per year is grown with an average yield of 5.5 tonnes per ha (Table 4). About 70% of the maize produced on irrigation schemes is marketed locally and only about 30% is marketed through formal channels of Agricultural Marketing Authority (AMA). This emphasizes the key role of these irrigation schemes for food security in drought prone areas. Other important crops are edible beans, wheat, cotton and vegetables. Yields achieved by farmers from these crops are quite comparable to dryland yields achieved by large-scale commercial farmers (Table 5). Most of the field crops like cotton and wheat are marketed formally through government channels. However, most vegetable crops like tomatoes, green mealies and cabbages are marketed locally around irrigation schemes. In the Manicaland province, however, tomatoes are marketed mainly for manufacturing purposes to firms who usually provide the market and transport to farmers.

#### ORGANISATION AND MANAGEMENT OF DERUDE SCHEMES

On the DERUDE schemes, responsibilities are split between management of the scheme and extension services. DERUDE is responsible for management functions and maintenance of the schemes. AGRITEX provides extension services. This requires DERUDE and AGRITEX workers living and working together on the irrigation schemes. Typically, on the larger schemes (over 100 ha.) DERUDE provides an Irrigation Manager and Maintenance Manager and maintenance staff. AGRITEX extension staff would then liaise with the Irrigation Manager. On smaller schemes, AGRITEX workers would be responsible for management and extension services and no DERUDE Officer will be posted on the small schemes. This split in responsibility between DERUDE and AGRITEX

Table 4

National production on Small-holder irrigation schemes

Annual average : 1970-1979

<u>Crop</u>	<u>Area (ha)</u>	<u>Tonnes</u>	<u>% Marketed through government</u>
Maize	2 031	10 802	31
Beans	1 231	1 451	87
Wheat	907	1 465	68
Cotton	527	870	100
Vegetables*	167	43 248	0
Groundnuts	99	162	67
Tomatoes	48	39 924	0
Sorghum	18	30	40
Potatoes	11	50	94
Finger Millet	8	14	36
Soya Beans	4	52	43
Green Mealies	163	12 258	0

\* Vegetables excluding tomatoes

Source : Central Statistical Office, 1970-1979

Table 5

Average yields (kg/ha) : 1970-1979

Communal Land irrigation schemes

<u>Crop</u>	<u>Irrigation Communal Lands</u>	<u>Dryland Communal Lands</u>	<u>Dryland Commercial Farms</u>	<u>Dryland Small-Scale Commercial Farm</u>
Maize	5 494	656	4 732	1 586
Wheat	2 256	-	2 025*	-
Cotton	1 887	822	1 650	800
Groundnuts	1 687	581	1 710	549
Sorghum	2 020	516	1 854	520
Soya Beans	2 036	-	1 601	526
Potatoes	4 183	-	-	-
Finger Millet	1 724	500	-	587

\* Commercial irrigation

Sources : C.S.O. (1970-1979), Muir, K. (1981)

and field (scheme) level has its problems. The main problem seems to be that of divided loyalties. Disputes between DERUDE and AGRITEX workers are difficult to resolve since this means cutting across ministries for action.

### Irrigation Management Committees

A feature which has emerged in the last three years on irrigation schemes is the Irrigation Management Committees (I.M.C.). These committees have emerged as a form of 'water users' association'. The Committee is elected by the plot-holders. The main role of these committees is to liaise and assist in the management of the irrigation schemes. It is a government policy objective that farmers ultimately take over the management and maintenance of irrigation schemes. The I.M.C.s are viewed as a starting point at a stage where all present schemes are heavily subsidized by government.

### Farmers Organizations

Farmers Co-operatives and Master Farmer groups are the oldest farmer organisations on small-holder irrigation schemes. Farmers' Co-operatives are orientated towards marketing produce and procurement of inputs. Master Farmer groups have been developed by the extension service over a long period of time, on the basis of training the progressive farmers who co-operate with extension agents. The 1982 survey showed that 29 out of 50 schemes had Farmers' Co-operatives. Manicaland and Matebeleland Provinces have had co-operatives for much longer periods than the other provinces (Table 6).

The co-operatives on irrigation schemes are all orientated towards marketing and transportation of produce and farm inputs.

### ORGANISATION AND MANAGEMENT OF ARDA SCHEMES

ARDA schemes are organised on different lines to DERUDE schemes. The ARDA irrigation scheme is split between a large 'core-estate' (state farm) and a small settler section. The 'core-estate' is farmed as a large unit by an ARDA management team. As part of the ARDA management team is a Settlement Officer, responsible

None	1	5	5	-	11	3	24
1 - 5	2	2	2	2	1	2	11
6 - 10	-	1	1	1	1		4
11 - 15	1	-	-	6	2		7
16 - 20	5	-	-	2	1		8
21+	1	-	-	-			1
<b>TOTAL</b> <b>SCHEMES</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>11</b>	<b>14</b>	<b>5</b>	<b>55</b>

Source: M. Rukunt (1983)

Table 6

Farmer Co-operatives on Irrigation schemes

Age (years)

Years

Manicaland  
Province

Victoria  
Province

Matebeleland  
North Province

Matebeleland  
South Province

Midlands  
Province

ARDA Schemes

TOTAL Schemes

for settlers. The objective is for the 'core-state' to provide services to the settlers. These services include land preparation, water supplies, credit administration and so on. The ARDA team, through the Settlement Officer, provides the agricultural extension service. ARDA controls the settler accounts and recovers credit through a stop order system on the marketed revenue. This has caused problems of late payment of farms in some cases.

#### COST RECOVERY AND INVESTMENT PATTERNS

The government subsidizes about 89% of the operation and maintenance costs (excluding staff salaries) of DERUDE schemes and has never attempted to recover any of the capital costs. This level of subsidy is justified on the grounds that most of these schemes in Communal Lands though financially unattractive are socially desirable. This situation has prevailed for the entire lives of all schemes. Present plans are for farmers to increase their contribution towards operation and maintenance to about 25% through maintenance charges as from 1983/84. This applies more to the financially viable schemes.

The government is committed to the continued development of existing and new schemes. The existing schemes are developed to about 20% of their potential areas. New schemes are being identified. The government strategy is to give priority to rehabilitation of existing schemes and expand those with potential, before construction of new schemes. The government is encouraging small irrigation schemes, constructed and run by local communities.

DERUDE plans all new schemes to be designed on the basis of integrated rural development projects. There would be consultation with other relevant ministries to provide schools, clinics, roads, domestic water supplies and in cases, marketing facilities.

#### POLICY AND HISTORICAL BACKGROUND

The history of irrigation development for peasant farmers

dates back to the year 1912. The period 1912 to the present has seen a number of changes in government policy and objectives (Table 7). Table 8 correspondingly shows the government organisations who have handled management and agricultural extension on irrigation schemes over the relevant periods to date.

The period 1912 - 1927 has been described as the period of 'incorporation into indigenous agriculture' (Roder, W. 1965). Irrigation schemes were first developed in Manicaland Province, in the east of Zimbabwe. These Manicaland schemes dominate the history of irrigation development up to the end of the Second World War. These early schemes in Manicaland were established with the assistance of Christian Missionaries. These small schemes were in aid of famine-relief in areas frequently suffering from severe droughts. For this reason peasant farmers actively participated in the conservation and running of the irrigated land.

The period starting 1928 was marked with the first active involvement by government in irrigation development when E.D. Alvord was appointed the first 'Agriculturist for the Instruction of Natives' in 1927. For about ten years Alvord seemed to accept that the main purpose of these irrigation schemes was famine relief. This meant that local farmers had a large measure of control over the use of irrigation. Farmers would take up small irrigated plots, usually less than a hectare and would continue to rely heavily on the dryland production of crops. This liberal policy began to fade in 1936 when Alvord, on behalf of government, took over one irrigation project from local farmers. A number of other schemes in Manicaland Province were taken over and re-organized by government. In the same year, a water rent was set up as government sought to encourage farmers to regard irrigation more in terms of financial returns than mere famine relief. To achieve this objective, new restrictions were introduced forbidding irrigation farmers from dryland cultivation. In cases, compulsory crop rotations were introduced (Roder, W., 1965). Alvord went on

Table 7

Periods of changes in policy and objectives

<u>Period</u>	<u>Policy Objectives</u>
1912 - 1927	Incorporation into indigenous agriculture
1928 - 1934	Local participatory control
1935 - 1945	Active but restricted development
1946 - 1956	Resettlement of displaced farmers
1957 - 1965	Period of economic concern
1966 - present	Integrated rural development

Source: Roder, W. (1965), Rukuni, M. (1983)

Table 8

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Management and extension on irrigation schemes  
1932 to 1983

<u>Period</u>	<u>Government Agency</u>	<u>Functions</u>
1932 - 1944	Ministry of African Affairs	Extension and Management
1945 - 1963	Internal Affairs Administration	Management
1951 - 1963	Department of Native Agriculture	Extension
1964 - 1968	Department of Conservation and Extension [MOA]	Extension and Management
1969 - 1978	Ministry of Internal Affairs	Extension and Management
1978 - 1981	Department of Agricultural Development [DEVAG] MLRRD.	Extension and Management
1981 - present	Department of Rural Development [DERUDE] MLRRD	Management
1981 - present	Department of Agricultural, Technical and Extension Services [AGRITEX] M.C.A.	Extension

Source: MLRRD, 1983

to be the first Director of the Department of Native Agriculture in 1951.

By the year 1950, government had developed plans to expand existing irrigation schemes and construct new ones as a means of intensive settlement of peasant farmers. These plans were somewhat urgent in implementing the Land Apportionment Act of 1931, which divided all land into black and white designated areas. One way of re-settling peasant (black) farmers from white designated land was through irrigation schemes. This programme, being of high government priority, led to more schemes being constructed. However, these schemes were justified on political ground since technical and economic criteria were not considered as important. Amongst all these problems of poorly identified schemes, the popularity of irrigation farming fell during this period, with government generally finding it difficult to get volunteers to farm the irrigation schemes. This led to under-utilization of these irrigation schemes and poor performance had to be accepted from those farmers willing to farm on the schemes.

In 1957, the Department of Native Agriculture employed an economist for the first time to look at the profitability of irrigation schemes and plots. His research indicated that all schemes were uneconomic (Hunt, A.E., 1958). Hunt's findings heralded the 'period of economic concern'. An Irrigation Policy Committee was set up in 1960 to examine the justification of irrigation as a means of settling black farmers. The Committee came up with recommendations discouraging irrigation as a means of settling displaced farmers, in the belief that the population pressure in black areas was temporary as more would find employment on white farms. The Committee recommended that government re-direct investment to the industrial sector and that any future irrigation projects should be on voluntary agreement of settlers where the settlers would meet costs of construction, operation and maintenance.

There was a brief period between 1960 and 1965, when further

construction of irrigation was stopped. However, government reviewed the role that irrigation played in peasant farming areas, and this started the new era of integrated rural development projects based on irrigation. The government instituted a parastatal in 1966, the Tribal Trustland Development Corporation (TILCOR), and gave it the mandate to create 'growth points' in Communal Lands (then Tribal Trust Lands). In 1981, TILCOR was absorbed into ARDA. This policy of integrated rural development seems to be the basis of irrigation development by DERUDE and ARDA.

#### LAND TENURE AND WATER RIGHTS

Land in Communal Lands is communally owned. The Water Act of 1927 attaches water rights to land and not individuals. This means that peasant farmers in Communal Lands cannot own water rights. The Minister of Lands, Resettlement and Rural Development holds water rights for all DERUDE irrigation schemes.

The responsibility of allocating plots on existing irrigation schemes lies with a DERUDE official and the farmers irrigation Management Committee. On new schemes a DERUDE official and representatives of a local government, (the District Council) form the selection team. Local party political officials is given to farmers displaced by the irrigation development.

#### THE SMALL-HOLDER IRRIGATION SURVEY 1982

The following presentation includes results from two surveys conducted by the author in 1982. The first survey was aimed at organizational and management issues on DERUDE and ARDA irrigation schemes. The second was a farm household survey on management and production data.

#### Extension services and management of irrigation schemes

The DERUDE management team varies with the size of the scheme. (Table 9). Manicaland has the largest schemes hence some of the schemes have teams of 5 to 7 extension workers. On these large schemes, AGRITEX extension workers are in liaison with a DERUDE Irrigation Manager. On these schemes, DERUDE also provide water bailiffs and general hands for maintenance.

Table 9

Size of extension team on DERUDE schemes by province  
(number of schemes)

Number in team	Manicaland	Victoria	Matabeleland North	Matabeleland South	Midlands	TOTAL
1	3	5	7	8	13	36
2	1	2	0	1	0	4
3	1	1	0	1	0	3
4	0	0	0	0	1	1
5	1	0	0	1	0	2
6	2	0	0	0	0	2
7	2	0	0	0	0	2
Total Schemes	10	8	7	11	14	50

Source: Rukuni, M (1983)

Most of the schemes in other provinces have only one extension worker residing and these have to cover both extension and management functions. On very small schemes, the extension worker is part-time on irrigation and covers dryland farmers as well.

#### Working experience of extension and management staff

There are two ranks of extension workers on irrigation schemes. The Extension Worker (EW) is the lower rank; the Extension Supervisor (ES) is the higher rank. The EW is the extension field contact with the farmers and is of the same status and rank with the EW on dryland farming. The ES is a rank of promotion from EW. This rank usually represents more than 10 years working experience as an EW. The ESs tend to be posted on supervisory capacity on those large schemes with several EWs. On these large schemes the Irrigation Manager (IM) is the overall in charge. These IMs are usually ex-ESs from AGRITEX with considerable irrigation experience, re-employed by DERUDE. What this means is that the larger schemes especially in Manicaland, have the services of more experienced ESs and IMs (Table 10). Out of the 89 EW respondents of the survey, 56 were previously EWs working on dryland, the other 15 were direct entries into irrigation extension with no previous job experience.

Most AGRITEX workers on irrigation schemes regard their job as concentrating on technical matters like crop husbandary and livestock improvement. Very few extension workers regarded administrative and social issues as their responsibility. This situation presents no problem on large schemes with an IM, (DERUDE) who is normally responsible for such issues. On schemes where AGRITEX extension workers perform both extension and management roles, there is more emphasis on the role of Irrigation Management Committees who are elected by farmers. Such schemes are visited by an itinerate manager (DERUDE).

Table 10

Extension and Management posts (50 schemes) sample

<u>Province</u>	<u>Extension Worker</u>	<u>Extension Supervisor</u>	<u>Irrigation Manager</u>	<u>Total</u>
Manica	31	1	4	36
Victoria	11	-	-	11
Matebeleland North	7	-	-	7
Matebeleland South	15	2	-	17
Midlands	17	1	-	18
<b>TOTAL</b>	<b>81</b>	<b>4</b>	<b>4</b>	<b>89</b>

Source: Rukuni, M. (1983)

## CONCLUSIONS

An important characteristic of small-holder irrigation organization in Zimbabwe is that management and agricultural extension are located in two different ministries, MLRRD and MOA respectively. This has created problems of divided loyalties by staff on irrigation schemes and makes co-ordination more difficult. If a single organisation was to take sole responsibility for small-holder schemes then this would be one of the ministries among MOA, MLRRD and MWRD.

The Irrigation Management Committees (IMCs) have emerged as a move giving more farmer participation in the management and maintenance of irrigation schemes.

The Farmers Co-operatives on some of the schemes could be used as a vehicle towards increased production of schemes. This would be through the provision of inputs and marketing services.

The government heavily subsidizes the small-holder schemes. Development of more schemes is underway and these levels of subsidy may stay for a long time.

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