

# WORKING PAPER

No. 16

Land Tenure Issues in  
Irrigation Planning Design  
and Management in Sub-Saharan Africa

Mary Tiffen

O 85003 096 X

June 1985



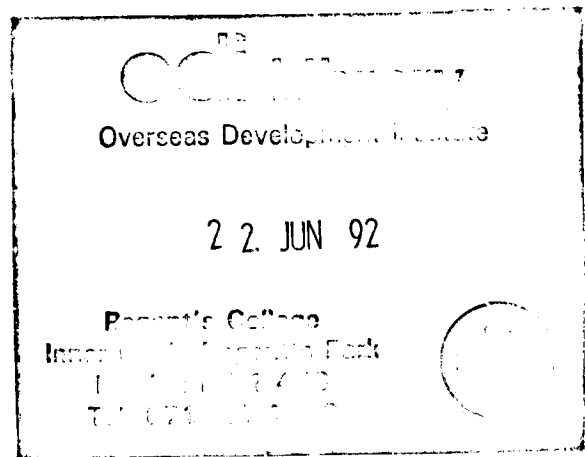
**Overseas  
Development  
Institute**

10-11 Percy Street London W1P 0JB  
Tel: 01-580 7683

Overseas Development

22 JUN 92

OFFICE  
of the  
Secretary of State



Overseas Development Institute

WORKING PAPER

No. 16

Land Tenure Issues in  
Irrigation Planning Design  
and Management in Sub-Saharan Africa

Mary Tiffen

O 85003 096 X

June 1985

### Acknowledgements

This paper was originally written in October 1984 as a Working Paper for the United States Agency for International Development (USAID) financed Overview of Irrigation in Africa. It was commissioned by Utah State University which is a participant in USAID's Water Management System II programme. We are grateful for permission to reproduce it.

ODI Working papers present in preliminary form work resulting from research undertaken under the auspices of the Institute. Views expressed are those of the authors and do not necessarily reflect the views of ODI. Comments are welcomed and should be addressed directly to the authors.

Mary Tiffen is a Research Officer at ODI

Overseas Development Institute  
10-11 Percy Street  
London W1P 0JB

## CONTENTS

1.	<u>LAND TENURE IN AFRICA</u>	1
	1.1 CUSTOMARY LAW	2
	1.2 CHANGES IN CUSTOM	2
	1.3 CUSTOMARY LAW ON IMPROVEMENTS	3
	1.4 MOSLEM INHERITANCE RULES	3
	1.5 THE CURRENT TENSION BETWEEN GOVERNMENTS AND FARMERS	4
2.	<u>WATER RIGHTS</u>	5
	2.1 MOSLEM COUNTRIES	5
	2.2 NATIONAL LEGISLATION	6
	2.3 CUSTOMARY LAW AND LOCAL AUTHORITY BY-LAWS	7
	2.4 MAIN ISSUES ARISING	8
3.	<u>TENURE AND MANAGEMENT IN FARMER-INITIATED SYSTEMS</u>	10
	3.1 PARTIAL CONTROL SYSTEMS	10
	3.2 FULL CONTROL SYSTEMS	12
	3.3 SOME COMMON CHARACTERISTICS OF FARMER-INITIATED SCHEMES	14
	3.4 ISSUES FOR CONSIDERATION	15
4.	<u>TENURE: ISSUES ARISING DURING PLANNING AND IMPLEMENTATION</u>	17
	4.1 INVESTIGATIONS IN SCHEMES NOT PLANNED TO INVOLVE DISPLACEMENT	18
	4.2 SCHEMES INVOLVING DISPLACEMENT OF EXISTING FARMERS	19
	4.3 ISSUES NEEDING ATTENTION AT FEASIBILITY STUDY STAGE	22
	4.4 SETTLEMENT SCHEME PLANNING	23
	4.5 ISSUES ARISING IN PLANNING SETTLEMENT SCHEMES	27
5.	<u>TENURE AND MANAGEMENT ON SETTLEMENT SCHEMES</u>	29
	5.1 JUSTIFICATIONS FOR SETTLEMENT SYSTEMS	29
	5.2 RIGHTS AND DUTIES OF TENANTS AND MANAGEMENT	30

5.3	ATTITUDES OF TENANTS TO THEIR STATUS	33
5.4	CHANGES IN TENURE OVER TIME	36
5.5	MANAGEMENT IMPLICATIONS OF THE TENANCY SYSTEM	37
5.6	ISSUES FOR CONSIDERATION	38
6.	<u>TENURE AND MANAGEMENT ON EXTENSION STYLE SCHEMES</u>	41
7.	<u>AREAS WHERE FURTHER RESEARCH IS NEEDED</u>	43
	APPENDIX 1 : BIBLIOGRAPHY ON LAND TENURE IN	
	IRRIGATION AND WATER LAW	44
	APPENDIX 2 : BIBLIOGRAPHY FOR AFRICAN LAND TENURE	
	AND GENERAL PROPERTY CONCEPTS	62

# LAND TENURE ISSUES IN IRRIGATION PLANNING DESIGN AND MANAGEMENT IN SUB-SAHARAN AFRICA

## 1. LAND TENURE IN AFRICA

It is impossible to understand land tenure in relation to irrigation in isolation from generalised land tenure concepts. Unfortunately, as D Tallon observes (Introduction, Association Internationale des Sciences Juridiques, 1971) it is very difficult to make exact statements except on the basis of localised investigation. Custom can only be synthesised with caution. To everything that follows, therefore, exceptions and variants can be found.

### 1.1 CUSTOMARY LAW

Customary law is still the basis on which the African farmer acts and decides his economic strategy. Two groups of customary tenure may be distinguished. On the one hand, there are various communal systems, in which land is owned by a lineage or a village. Customarily, there was no outright sale, since the owners included the dead and the unborn. Usage rights are heritable, and can also be temporarily assigned, by pledge, lease or loan to another, including strangers. Usage rights may be re-allocated yearly by lineage or village head or held for life. They may be held only by the household head or also by wives, children and dependants, depending on the farming system and also on religion. (In Islamic areas women play less role in farming than in non-Islamic societies). Rights are generally based on the claim of first clearance for cultivation; a lineage may control a large area over which ancestors cleared scattered, shifting fields. Consequently, descendants of more recent immigrants have less land, or hold by favour of the first claimants. However, this already reflects a situation of some population growth; in very lightly populated areas the original immigrants can simply clear (Tiffen 1976). An element of flexibility is the ability to adopt strangers into the lineage/village, thus conferring equal rights to land (eg. Chambers and Moris 1973, p. 55). A second group of customs derive from rights of conquest, and this is sometimes strengthened by reference to Islamic law on the rights of Moslem conquerors to take over pagan lands. In this case, a military ruler may have given out territory to his chiefs, whose descendants may still claim to be 'maîtres des terres' with rights of allocation and control. Generally, however, these rights are exercised in

a way that respects local inheritance customs. They are also modified by the low value of land in sparsely populated areas, and the need to encourage immigrants as clients, if a chief is to retain his influence. With the Mende of Sierra Leone (Little 1951) and the Toucouleur of Senegal and Mauritania (Crousse 1983) society may be stratified into descendants of warriors and descendants of captives. While the powers of the elite group declined in colonial and post-colonial times, they sometimes still retain enough influence to manipulate land control at village level.

## 1.2 CHANGES IN CUSTOM

Group control can become so vague it is just the payment of a due or tax. In the northern states of Nigeria taxes paid by farmers to the 'Native Authority' were direct replacements of dues in kind previously paid to emirs and chiefs. The British found it useful to conceive that they had, by conquest, taken over the rights of the Sultan of Sokoto as ultimate controller of the land. All land was therefore state land, on which farmers had customary rights of usufruct.

Even when there was not such a convenient Moslem doctrine to hand, colonisation created the concept of State land, Crown land, Régime Domaniale, for unclaimed or 'unused' land. Thus colonial powers found it useful to emphasise the State's national control, often delegated through local authorities and local courts who could take account of 'native law and custom'. As Caponera (1979) said (in respect of water) the principal of "community interest" or "ownership" in land and water "may greatly facilitate legal and institutional measures for bringing all water resources under centralised state control." The principal also appealed to the socialist philosophy of many leaders of newly independent states. Agricultural officers were amongst the keenest advocates of retaining state control and preventing any move to a freehold-type tenure, in order to be able to enforce soil conservation and 'good' farming methods and to prevent fragmentation and land speculation. Dumont, in his influential book 'False State in Africa' (1966 in English, 1962 in French) was much against freehold for 'ignorant and lazy African peasants'. Masefield 1952 reviews other reasons for limiting rights in land.

Political officers, more in touch with what was going on in native authority courts, more conscious of the dangers of riot and discontent stirred up by interference with land rights, were usually more cautious (Palmer-Jones 1981). Already in 1952 Meek recognised and listed the social and economic

forces, coming from population growth, the opportunities for commercial sales, the greater independence of young men, the smaller need for protection from chiefs and elders, which were leading, particularly in areas where land had become permanently farmed and commercial crops grown, to recognition of individual rights to particular fields, which included the right of outright sale. There are several references in the literature to African farmers having become *de facto* freeholders (eg. in Meek 1952, Biebuyck 1963) and the process was also being recognised in local authority courts. For example, in 1960 in Gombe, Northern Nigeria, the 'native authority' recognised the right of sale of land which a man had himself cleared from bush. By 1970 the NA's chief judge recognised also the right to sell land that had been inherited or bought (Tiffen 1976, p. 118). In countries like Kenya the prospect of individual registration of titles, which began in the 1950s, must affect even those areas still awaiting registration. The spread of Islam also has served to spread notions of individual tenure. In less densely populated areas land is still likely to be controlled according to older custom.

### 1.3 CUSTOMARY LAW ON IMPROVEMENTS

It should be recognised, however, that custom generally gives considerable protection to improvements. This was one reason why improvements - manuring, irrigation, etc, were not allowed on loaned or pledged land (Rowling 1952). Rowling noted that in African eyes the man who plants or builds on land he is lawfully occupying, owns the improvements. Even if he is ejected from the land and village, he has the right to reap his tree crops. Rowling went on to comment that this raised problems in ejecting a "settler" from a scheme or a crown tenant, for failing to pay his rent; what to do about his house and trees. The African would think it inequitable he should lose these as well as his lease. In Mende society, by 1952, if people had cultivated a piece of land for 20-30 years, the owner would not be allowed to dispossess them without their agreement, and without providing at the same time, alternative land and even houses (Little 1952).

### 1.4 MOSLEM INHERITANCE RULES

Moslem laws on the inheritance are enshrined in the Sharia, and are therefore not susceptible to change by legislation. They are respected by all good Moslems. This is particularly so in long Islamised countries like the Sudan; in the Sahel and Savanna areas Moslem law is gradually affecting traditional custom. It prescribes land division with two shares for a son

and one share for a daughter and a widow's portion. It applies both to land and improvements, eg. trees, which can therefore be separately owned. As Islam recognises private ownership of land by Moslems, this is another influence towards individualisation, (Adam, Farah Hassan 1966, Crousse 1983).

#### 1.5 THE CURRENT TENSION BETWEEN GOVERNMENTS AND FARMERS

The situation frequently is, therefore, that in the more densely populated areas the farmer has moved to a position where he feels the land belongs fully to him; while the politicians have moved to enshrine state control in new national legislation. Thus we can get a consultant reporting in 1984 "Officially, all the land in the area is owned by the Government; smallholders claim to be owners of their land but in fact they only have a right of use of the land". They go on to recommend that the land become an estate. In densely populated areas, however, farmers are able to organise, or are sufficiently politically important, to enforce recognition of their rights of ownership, as has happened in Nigeria (Chapter 4).

Where the state does promulgate new national laws, it is the educated and commercial classes who first realise the new opportunities. The concept that the land belongs to him who develops it - 'mettre en valoir' - is enshrined in the 1980 Senegalise law, and gives rights to those with money to put in an irrigation pump (Mathieu 1983a). It can be at odds therefore, with the socialist philosophy supposedly behind it.

Such national laws, Mathieu shows, tend to rigidify tenure. 'Owners' refuse to lend or lease as easily as before, for fear of losing their land. Uncertainty is created over rights, but as Bromley 1981 has observed, predictability of rights, duties and obligations are necessary conditions for a dynamic society. As Coward has observed, it is particularly so in irrigation, where management and maintenance are linked to ownership (Coward 1983).

Specific relationships of land tenure to irrigated land will be treated in the following chapters and in the bibliography Appendix A. The bibliography in Appendix B gives some of the important works on African tenure, which illustrate the way it has adapted to new situations and tended towards more individual rights, in this century.

## 2. WATER RIGHTS

### 2.1 MOSLEM COUNTRIES

The main sources are the FAO reports, ed. Caponera 1973, and 1978. The first volume reviews general Islamic thinking and that of different legal schools on water law, before giving individual country studies. The country studies continue in Volume 2. Islamic law evolved in the arid countries of the Middle East. As Caponera states (Caponera 1973, p. 29):

In such areas, the land itself is of secondary importance, its only value being derived from its productivity which, in turn, depends on irrigation rights attached thereto. As water becomes scarcer, it becomes more essential to soil fertility and gradually develops into an object of ownership independent of the land...

... In this case, water becomes the main object of ownership. It is purchased, sold, allocated or constituted in waqf or habous, often along with, and sometimes independently of, the land it irrigates.

Some general principles common to all schools derive from agreed sayings of the Prophet; these include that high-lying areas should be irrigated before low-lying ones (leading to a frequent presumption that upstream owners may take water for irrigation, provided they return the surplus to the stream, regardless of the effect on downstream irrigators), that the quantity of water used should not exceed ankle depth; that ownership of canals, wells, etc., entails rights to a certain extent over neighbouring land - there is a harim or protected area, within which rival works are not permitted (Caponera 1973, p. 28).

The importance of these precepts is that they are based on religion. Like the Moslem precepts for inheritance, they are not susceptible to change by national legislation. They may be ignored in practice, particularly in African countries where Islam is a recent introduction and original customs still prevail ; but all strict Moslems will consider themselves bound by them, whatever man-made law may say. The 'right of thirst', the duty to provide water to the thirsty (including, secondarily, animals), is also a religious precept.

The most Islamized of the countries here under survey are northern Sudan and Somalia, which also have the arid climate characteristic of the Middle East. However, Islam is influential in most Sahelian countries, (covered in Caponera 1978), and in the savanna areas to the south (not included in Caponera 1978).

In a third report on other African countries Caponera 1979 singles out one tradition that all waters are the common entitlement of the whole community. It is, however, quite clear from the earlier work that private ownership of water,

apart from large rivers, and lakes, is accepted (Caponera 1973). The interpretation in the later work appears to reflect the author's desire for national control of water. Adam 1971 explains how water charges on the private pump schemes in Sudan vary according to land cultivation rights and cropping patterns in a fashion very typical of the Middle East.

## 2.2 NATIONAL LEGISLATION

National legislation on water is summarised in Caponera 1973 for Somalia, Caponera 1978 for Chad, Gambia, Mali, Mauritania, Niger, Senegal and Sudan, and Caponera 1979 for Benin, Burundi, Ethiopia, Gabon, Kenya, Mauritius, Sierra Leone, Swaziland, Upper Volta, and Zambia.

In most of the former French colonies, all waters belong to the public domain by law, except for wells and cisterns built by individuals on their own land. However, it is noted that the population 'frequently behave as owners of water and not just as users' (Mali, Niger, Senegal, Benin, Upper Volta). In Gabon, irrigation channels etc. on private land are specifically private. In countries deriving their legal system from British common law, water in drains, reservoirs and underground is private so long as it is in the abstractor's possession. The right to use water is somewhat more extensive, particularly for owners of riparian land. The United States' "prior appropriation" doctrine giving priority to the first constructors does not apply in Africa. For many countries, water law is vague or leaves important gaps. The countries with the most comprehensive laws amongst those studied by Caponera were Sudan, Kenya, Mauritius and Zambia. Zimbabwe, not studied, is similar to Zambia.

In Sudan, water rights attach to land. The Nile Water Use Control Board monitors quantity and controls pumping from the Nile, for which it issues licences. These specify the season water can be used, size of intake, etc., and are automatically renewed every ten years. The pump owner, an individual, a co-operative, or a government agency, takes 50-60% of the crop in payment (Barbour 1972; Khider and Simpson 1968). Well and hafir construction is subject to permission from the Rural Water and Development Corporation. (Caponera 1978).

In Zambia the Water Board grants water use rights, including rights for irrigation, after investigation and subject to conditions, including respect of existing rights and to payment of compensation for any expenses incurred by a deprived party. There is no groundwater legislation.

Swaziland revised its legislation, based on riparian rights, in 1967 (Caponera, 1978).

In Kenya, the Water Act gives domestic users priority. The use of water for irrigation requires a permit. There is some control of groundwater abstraction and some juridical protection of rights of existing users, eg. before draining a swamp (Caponera 1979).

Some very large African countries such as Nigeria and Zimbabwe are not yet covered by the FAO review.

### 2.3 CUSTOMARY LAW AND LOCAL AUTHORITY BY-LAWS

Despite the note made concerning the individual countries cited in section 2.2, on the population behaving as if they owned water, Caponera 1979 states in his introduction that under existing African customary law, private ownership of water has remained generally unknown and individuals have only a right to use water. As already commented (1.2), this is a measure of his preference for State ownership of land and water. In fact, little work has been done on customary water rights. Meek noted the following as areas needing study: village rights over waterways, beaches and fishing grounds, and the concept of village ownership of undeveloped land, including swamp land, (in areas where village boundaries were fixed) (Meek 1952).

What work has been done has been mainly in connection with pastoralists. This is mainly in connection with arid areas where it is likely that water supplies are too scarce for irrigation and will be mainly used for human and animal consumption. Generally, dams, hafirs, cisterns and wells belong to the person or group who have constructed them, or to particular villages. Sandford (1983) notes examples in Sudan and Ethiopia. He also notes the lack of information on rules for water management, control of access, and on the location of authority. In Botswana, a government programme gave District Councils the option of managing themselves new hafirs or dams constructed with Government aid, or of handing over responsibility to user groups. Here, dam groups assumed direct management, though formal handovers were rare (Fortmann and Roe 1981). As a working hypothesis, it seems reasonable to assume that pastoral groups in arid areas will consider themselves to have ownership and management rights over their constructions.

In Machakos District, Kenya, the County Council derived revenue from a cess on lorries removing sand from the river bed, and were upset over lack of

consultation by the central government's aided Machakos Integrated Rural Development Project. The latter failed to consult the County Council in its water development plans, which would have banned sand extraction. This is indicative of a conflict of jurisdiction over river beds, which could also affect irrigation (Tiffen 1983).

In regard to canal construction, few indigenous schemes have yet been studied. Gray studied the Sonjo system in operation in Tanzania in the 1950s, a considerable time after construction. Ultimate control belonged to 17 hereditary elders who had priority rights. (Gray 1963). This system is no longer operating. In the Marakwet system in Kenya the furrows belong to the clans or lineages constructing them; individuals have water rights attached to their land rights. Some 'modern' trading, health or educational institutions have tapped the furrows for piped water, arousing little or no opposition. But there is potential conflict if their demands grow (Ssenyonga 1981).

## 2.4 MAIN ISSUES ARISING

Many African countries have no legislation or juridical principles on areas central to good water resource planning and irrigation planning:

- 2.4.1 Priority between uses: human, especially urban, needs versus agricultural or livestock needs. This is an issue that is vital to river basin planning. Yet it is not, apparently, among the tasks given to the River Basin Development Authorities (RBDA) in the Nigerian Act establishing them in 1979 (Griffith 1982 lists their main duties). Their tasks are to develop water resources for multi-purpose use, provide water for irrigation and urban supply, but not establish priorities, monitor use, or ration water. As a consequence, a RBDA can commission studies for farming use of water, whilst a State Water Corporation concludes all the water is likely to be needed for domestic and industrial use (Siann 1980). The Marakwet example cited above shows that a similar conflict could arise in Kenya. (Nigerian legislation on River Basin Authorities and land tenure is now changing - West Africa, 14 May 1984, p. 1009). A similar possible conflict between urban and agricultural needs is noted in Upper Volta (D'At de St Foulc 1983).
- 2.4.2 Irrigation priorities: Only a few countries have established systems for monitoring existing irrigation uses, and establishing priority rights as between upstream/downstream irrigators; first in time, later in time users; etc. A text book on irrigation planning using the Usangu Plains of Tanzania as an example notes the existence of furrows already constructed by farmers. It is probable the farmers concerned feel they own these improvements. The book considers a project for higher technology irrigation for State and co-operative

farms without discussion as to whether the furrow constructors have prior water rights, or indeed any rights whatsoever: for instance, rights to consultation or compensation when their water is diverted. (1) The rights of existing users of water from floods or ground water which may be modified by dam construction are also neither monitored nor protected, although they can suffer substantial loss (Adams, W.M. 1983, R F Stock 1977). Farmers in northern Nigeria are currently making substantial investments in wells and pumps which may be nullified if groundwater regimes are altered by government schemes upstream (Chapman 1984).

2.4.3 Monitoring and licencing systems: Few countries have these, either for ground-water extraction, or river water extraction.

It has been said that predictability of rights, duties and obligations are necessary conditions for dynamic society (Bromley 1982). Without predictability, farmers cannot make sensible plans for their economic strategy, nor will they be encouraged to invest. Generally speaking, legal predictability is lacking in Sub-Saharan Africa.

(1) Hazlewood, A. and I. Livingstone. 1982. Irrigation Economics in Poor Countries. Pergamon Press.

### 3. TENURE AND MANAGEMENT IN FARMER-INITIATED SYSTEMS.

Irrigation's place in the spatial context and in the historical development process is well considered in Ruthenberg 1980 . Full irrigation systems, and farms which are entirely irrigated, have not yet generally been found sufficiently worthwhile for farmers to initiate them themselves in Africa except in certain special circumstances. Partial control systems are more typical.

#### 3.1 PARTIAL CONTROL SYSTEMS.

Partial control systems are those where either the inflow or the outflow of water are regulated or partially regulated by human constructions, but where there is no full control over quantity and timing of both flows. One is concerned here with flood recession land, swamps, polders and valley bottoms, (wet lands).

The value of such land-use depends on two factors: rainfall and marketing opportunities. . Where consumption crops can be grown by extensive methods on rain fed land, this is preferred as less labour demanding, and the swamps, valley bottoms, riverine lands etc are used mainly for dry season grazing. It seems generally accepted that if local villagers do decide to cultivate these lands, in accordance with customary law, their right to do so takes precedence over users of the land for grazing. Conflicts can arise if the land is not cultivable by means within local resources, and the government takes it over for state purposes; likewise if a chief sells village rights, without consulting other villagers, to outsiders who use mechanical tillage, drain swamps etc, as in Ghana (Goody 1980, Konings 1981). It is only in exceptional political circumstances that pastoralists are able to get some recognition of their rights, eg. the Afar in Ethiopia (Beshah and Harbeson 1978, Simpson, G. 1976, Emmanuel 1975, Harbeson 1975).

When wetlands are near a lucrative market, they may be developed for high value crops such as sugar cane or vegetables, while rain fed lands are used for cereals etc. In this case, their sale or rent value is higher than that of rain fedland (Turner 1977, for northern Nigeria).

Where rainfall is unreliable or inadequate, a plot of wet land is valued. If markets are not available and population is sparse,

a small area only is needed for consumption, and the land has no cash value. Here however, customary controls by lineage heads, *maîtres des terres* etc. are manipulated to ensure priority access as against 'strangers' or politically less powerful groups (many examples in the literature from Senegal). In very arid areas this land has a high value and may be individually held and commercialised, as in the Sudan (Dafalla 1975). In the Jamu'ija area government attempts to nationalise this land were resisted with violence (Shepherd 1980). Such land has been developed in the past under a variety of tenure systems. Only a few of those mentioned in the literature will be singled out here. The traditional polders in Lake Chad seem to have been constructed by *corvée* labour under the local chief's direction. The workers were later rewarded by a plot. Later government developments went in advance of demand, so labour had to be paid with Food Aid. The rights already acquired by villagers came into conflict with the requirements of development projects (Bouquet 1983). Linacres 1981 found different types of tenure amongst Diola cultivating swamp and valley bottoms in Senegal. In one case, a large dyke was constructed collectively, but each section was maintained by those now owning the adjacent field, with collective responsibility only for a key danger point. The fields were worked jointly by husbands and wives, with tenure and inheritance going by the male line. In an inland swamp area, owned by descendants of the original three families developing it, the swamp plot was often worked by a woman lent the land by brothers and uncles and passing the land to her children. It is common for women to have rights in swamps in Gambia and Sierra Leone also. (eg. Dey 1980). In Upper Volta Mossi lineage heads manage the 'bas-fond' lands. While lineage members can plant trees, for non-lineage members, the loan of a plot specifically excludes use for trees. The lineage enforced its control much more strictly on 'bas-fond' land than on uplands. (Lahuec 1970).

In Madagascar, the oldest immigrants, developing a valley bottom for rice cultivation, became its owners. Late arrivals became share-croppers or from 1931, bought the developed plot. The upper slopes were collectively owned and used for pasture, the lower slopes were individually owned. However, sales, leases and share-cropping occurred only in the valuable rice lands. It is not clear who owned and maintained the irrigation channels (Marchal 1970).

In the Hadejia Valley, Nigeria, Sokoto immigrants took up land on the flood plain, bringing with them their techniques of channel construction and floating rice varieties to make effective use of the annual flood. (Stock 1977)

In all the systems noted, the wetland plot is only part of the family's total activities. It is invariably combined with either or both wet season cultivation of uplands, and livestock rearing (many literature references; summary in Kortenhorst 1980).

### 3.2. FULL CONTROL SYSTEMS

One can distinguish three main types.

#### 3.2.1. Individually owned systems: These are quite common in West Africa, probably covering more hectares in total than large scale schemes in many countries, but have not much been studied, particularly in their tenure aspects.

The main technology is the lever device, the shaduf, which enables a man to irrigate about 0.1 hectare. Normally this is on his own land, and this may be either fully in his own control, with sales, cash leases etc. in densely populated areas (Ega 1984), or subject to attempted control by village heads (exacting payment of dues) in the case of newly developed land in less populated areas. Recently, farmers have been investing in small pumps and wells to replace the shaduf, enabling them to farm more land. In some cases they have come to various arrangements for payment by others for the use of water or land which the owner is unable or unwilling to manage directly himself. For many years farmers owning small wet season farms in the densely populated Kano zone have migrated in the dry season to cultivate vegetables on irrigated plots they acquire on temporary loans or leases in suitable villages (Tiffen 1984b). While such migration may be less common elsewhere, the use of the shaduf, and its substitution by the pump also occurs in Niger, Upper Volta and Mali (FAO 1983). There is often a preference for individual ownership. In Mali, when USAID proposed 4 associate owners per pump, farmers were opposed and a single owner per pump was agreed (Moris 1984).

#### 3.2.2. Capitalist systems: By capitalist systems is meant irrigation covering a larger area than the normal area that an African farmer manages on his own, and where workers, share-croppers or tenants are used for part or all of production. Such systems have long been known in the Middle East and Gaitskell 1959, records the division between suppliers of capital

(water wheel, cattle) land and labour in the Gezira area early in the century. In the 1950s there was a boom in private pump schemes in the Sudan, when cotton prices were high and a pump investment could recover costs in three years. Leading families and politicians were amongst the investors (Barbour 1972). The fall in cotton prices, and the rise in fuel prices and difficulties in obtaining fuel, have since affected profitability.

In the 1960s many of these schemes were officially converted into co-operatives, a change that was often only nominal, with fifty per cent of crops being paid over for expenses, and the surplus, if any, much at the disposal of the officers (Khider and Simpson 1968). On some schemes there has been pressure for water rates paid in cash, but members who hold land as tenants still pay by share-crop. Fruit, vegetable and fodder producers pay cash (Adam 1971).

In Nigeria, at least some farmers have invested in large pumps and large farms, but no details on tenure arrangements are available.

In Zimbabwe some white farmers, as individuals or as syndicates, obtained grants of low veldt land and established irrigated estates for sugar, citrus and beef, from the 1920s onwards. Certainly in the 1950s these were government-aided; the State paying the cost of constructing dams, canals and communications, and the irrigators paying for the internal water distribution system, clearing and levelling, housing and other facilities. They appear to have been profitable (Pollock 1968). There are also medium sized private commercial farmers who have constructed their own dams and weirs, with or without assistance from the Agricultural Finance Corporation. Like the large estates, they are generally efficiently run (Mupawose 1984). There are known to be other commercial estates, elsewhere in Africa, but literature on these has not been found. In Kenya at the end of 1978, there were 10,000 irrigated ha in the public sector, 15,000 ha in the private sector and 800 ha in the communal, and it was the private sector that was expanding most rapidly. However Toksoz 1981 gives no details.

3.2.3 Communal or co-operative systems: These are systems in which control and ownership of the irrigation works

are located in a corporate body, either traditional or modern. As already remarked, the furrow systems of East Africa appear to derive their corporate control from clan or village institutions. This is also the case in the Taita Hills system, Kenya, recently observed by Fleuret 1984 . In the Anlo system in Ghana, which combines communal flood control and regulatory works and privately dug wells for supplementary irrigation, the land is held by 15 clans. Planting dates for the shallots are chosen by community leaders, usually large farmers, to prevent the spread of pests. Land distribution is uneven, with some individuals having a thousand beds, others less than 10, deriving both from usufructuary rights at the time of settlement, and inheritance patterns. However, there are many ways by which young men can enter the system or by which those with too much land to manage effectively can pass it to others - by short term fixed rents, longer term share-cropping arrangements, mortgage/pledge arrangements; seed and land sharing arrangements etc., and even sales. (Chisholm 1983; Chisholm and Grove, forthcoming.)

In at least one Senegalese village having a tradition of some communal fields, local people, led by a returning migrant aspiring to develop his village, wanted to organise a co-operative irrigation scheme with the help of a French technician, using indigenous institutions. In this case their plans were frustrated by SAED, which had a preconceived development programme (Adams, A. 1981). In other cases educated and enterprising members of a community have been able to organise a western style co-operative (Khider and Simpson 1968, re a New Halfa vegetable co-op). D'At de Saint Foulc (1983) describes how some Upper Volta peasants, abandoning an official scheme for green beans, set up, as individuals or small groups, their own irrigated gardens with small pumps and later accepted a French volunteer's help in organising a co-operative for marketing functions only.

### 3.3 SOME COMMON CHARACTERISTICS OF FARMER-INITIATED SCHEMES

The most characteristic type of full control system in Africa is a small, individually owned plot, with individually owned irrigation equipment. In partial or full control systems involving communal efforts to construct works, control of the land, farming processes and output is typically in the hands of individual families even if land allocation and some regulatory functions are carried out by lineage heads, chiefs, elders, etc. If marketing is co-operative, which is exceptional, the co-operative seems

to be usually more under farmer control than in the normal government-designed co-operatives. Normally, however, farmers market their own crops and many systems are obviously very much adjusted to market requirements. Holding size is usually variable as between families, and adjustable by various loaning, renting, pledging or selling mechanisms. There are a few exceptions to this in the Sudan, where the Gezira model is all pervasive. There, at least one farmers's co-operative also held land as a co-operative and divided it equally amongst members, who then made their own crop choices and cultural plans (Briggs 1983). The ownership of the protective works, channels etc. is more likely to be collective, though sometimes arrangements are made to give maintenance responsibilities to adjacent land holders. Communal work and responsibility tends to be restricted to the essential minimum. The schemes are necessarily run on lines that are profitable to the owners, covering their costs and producing either for the market or for local consumption, as appropriate. It is particularly noticeable that in isolated, lightly populated areas plot size is small, producing simply for family needs. Operators have been known to reject, correctly, expensive cash inputs of tractor services etc., which might raise output, but for which an adequate cash return could not be achieved (de Wilde 1967, re the Marakwet system). It is also noticeable that the labour-intensive small plot is often only part of a farming system which includes less costly rainfed farming, particularly for low value cereals, livestock raising etc.

#### 3.4 ISSUES FOR CONSIDERATION

Issues which require further research, or which it is felt USAID should raise with concerned governments, involve the rights and productivity of flood recession land users and ground water users, particularly when these may be affected by dams for irrigation schemes; the whole area of small swamp, fadama, or dambo development (wet lands) and whether this should not be left mainly to private and/or local village initiative; whether the rights of constructors of partial systems or low technology systems should be respected; the links between marketing, size of plot, and technology used; the economics of farming systems in which irrigation is a partial element, and is combined with rain fed farming, livestock raising, etc.

In schemes where communal activity has created dams, canals, etc., there is a need for a clear definition of the ownership and control of these assets, for an agreement amongst those concerned about the division of water, and for clarity over the tenurial status of the irrigated land. There is little literature on this.

It is noticeable that there is almost no literature on large private irrigation, nor on semi-commercial, semi-state estates, such as those initiated by the Commonwealth Development Corporation. In the latter case, there is more literature on the relatively small outgrower element at Vuvulane, Swaziland (Tuckett 1977, Cobban 1981) than on the nucleus estate. There are many examples of sugar plantations on this kind of model, whose success has varied with the price of sugar. In some cases they have been taken over by Government and have continued on efficient lines (informal talks with CDC officials). There is also the rather similar example of the SEMRY rice production unit in north Cameroon (Buchmann 1983). A significant comment on the Gezira is that "early commercial management ... was responsible for the satisfactory attitude towards cost control ... which has not been easy to achieve elsewhere. (El Hadari 1972).

Issues connected with how governments can stimulate, aid or advise additional farmer-operated systems are considered in Chapter 6.

#### 4. TENURE: ISSUES ARISING DURING PLANNING AND IMPLEMENTATION

At the planning and implementation stage, it is necessary to establish the existing situation in regard to land use, productivity and rights, and the number of people involved, in order to calculate benefits and costs in the with/without project situation, to make adequate arrangements for those who may be displaced, and to plan, in the light of the needs, resources and rights of the people concerned, physical and organisational arrangements for the new scheme. This may entail making decisions on housing provision, settlement layout, selection of irrigators and size of irrigated plot. It is not always easy to know how this was done, since the relevant documents are usually confidential feasibility studies. Reports after the event make it clear that the necessary investigations have often either not been made, or not thoroughly made. The result has been unanticipated costs, unanticipated loss of production, particularly off-scheme, unanticipated lack of commitment by the irrigators, who have other interests, displacement of people who have often quit farming and suffered much hardship, and the hostility of those who were supposed to benefit. In the few schemes where proper investigations were made, and taken into account, the initial years of the scheme seem to have been relatively trouble free. Problems have been particularly acute in schemes that have involved considerable displacement of the population.

We will therefore look first at schemes where either the existing population can be accommodated on the new scheme or where the development is in nearly 'empty' lands currently only seasonally used by pastoralists, or with only scattered rainfed farms. We will then look at schemes for areas already densely farmed where considerable numbers have been displaced, temporarily or permanently, by reservoirs, headquarters sites, construction activities etc. The issues raised by faulty or inadequate investigations at the feasibility stage will then be considered.

In many cases, it is decided to have what is known in Africa as a settlement scheme. This involves taking further decisions on tenant

selection criteria, tenancy size, and housing and village provision. The criteria used for these decisions will be examined. The justification of the settlement model and its management implications will be reviewed in chapter 5.

#### 4.1 INVESTIGATIONS IN SCHEMES NOT PLANNED TO INVOLVE DISPLACEMENT

The investigations into land tenure in the Gezira are described in Gaitskell 1959, Miskin 1953, Khalil 1970 and Salam 1979. The assumption land was state owned was soon proved wrong (Khalil 1970) and many owners produced written title deeds (Gaitskell 1959). The process of registering rights was not simple, due to Moslem inheritance rules (Miskin 1970). It is clear that trouble was taken to ensure general consent, to avoid political difficulty. The pilot demonstration projects had an important role in this, preceding the main scheme by several years (Tiffen 1984b). The land was leased at its highest rainfed value for 40 years; much was bought in by Government during the 1930s depression or later (Salam 1979, Khalil 1970). Khalil raises the issue as to whether leasing is an appropriate strategy for a national government, as opposed to an expatriate agency anxious to avoid conflict. Allocation of tenancies was done with and through the owners, and appears to have gone smoothly, so production activities started to time. The cropping pattern allowed for the desire to continue sorghum and livestock production.

The Gezira has in many ways been the model for subsequent Sudanese schemes, although the elements of pilot projects and of consideration for existing activities have tended to be neglected. In later schemes it has generally been thought sufficient to record rights and to offer compensation for loss of grazing and rainfed farms by offering priority access to tenancies on the scheme. This has been continued after the nationalisation of land in 1970 (Benedict 1982, Ebrahim 1983). The consequence is that the farmers concerned feel they have a moral right to their tenancies, although these are theoretically renewable annually. Owing to disputes about terms, neither the existing semi-nomadic farmers nor the displaced Nubians on the Khasm el Girba/New Halfa scheme had by 1979 signed their tenancy agreements. However, when the management tried to evict poor performers, protests were so strong that they or their relatives got the land back (Pearson 1980).

Main problems arising on this and similar schemes such as Rahad have been due to the failure to allow for continued interest in livestock, and the fact that settlers still have access to rainfed land for sorghum off the scheme. The Gezira has been exceptional in incorporating even a small fodder crop component. Consequently, settlers have generally maintained off-scheme interests, giving less than the optimum labour input to their tenancy, or appointing share-cropping managers, to look after the less profitable irrigated tenancy (Benedict 1982, Ebrahim 1983, Heinritz 1972, Hoyle 1977, Pearson 1980, Sorbo 1977). Similar failures to realise that settlers who previously lived in the area may retain rainfed land and will continue to own livestock, both of which they will take into consideration in planning their labour allocations, have been reported from many parts of Africa, east, south and west (e.g. Kortenhorst 1983 for Kenya, Hartog 1979 for Upper Volta).

#### 4.2. SCHEMES INVOLVING DISPLACEMENT OF EXISTING FARMERS

The difficulties, costs and stresses of resettlement of populations displaced by large reservoirs have been extremely well documented (Brokensha and Scudder 1968, Scudder 1973 and 1975, Chambers 1970). The demanding preparatory work, including identification of the rights and numbers of those entitled to compensation, and arrangements for their new accommodation and economic livelihood has been detailed by Butcher 1971 and described by an administrator responsible for the evacuation of the Sudanese Nubians (Dafalla 1975).

The Nubians displaced by the Nasr reservoir had a certain political importance. The Sudanese government also received compensation from the Egyptian government, so money was available to treat them as fairly as possible. Their rights, down to the last fraction of a date palm, were recorded and compensated. The local village and district authorities were involved in the planning (Dafalla 1975). They regarded their new tenancies at Khasm el Girba (now New Halfa) as compensation for disturbance, and insisted on also receiving double the quantity of freehold land that they had previously had, although this dislocated original plans for the division of the irrigated land (Heinritz 1972). New

Halfa had problems due to the Nubians' propensity to maintain their non-agricultural work interests, which have been more lucrative than farming, but at least a difficult operation passed off peaceably.

Available literature on resettlement does not seem to have been fully considered by the planners responsible for recent large schemes in northern Nigeria. The main issues involved are:

Land use and rights by those outside the project area who will be affected by changes in water availability

Ownership of land and issues of compensation within areas that will be needed for reservoirs, headquarters etc.

Compensation for disturbance for farmers losing income while construction activities take place on their land

Ownership of land within the project area, and any necessary rearrangements of holdings subsequent to development

The position has been complicated by differences of view amongst the farmers concerned and Federal authorities (the River Basin Development Authorities - RBDAs) on whether land was individually owned. The RBDAs view was enshrined in the 1978 Land Use Act, which asserted ultimate government ownership and gave State governors the right to revoke 'customary rights' and to grant leases, after compensation for standing crops and improvements. The farmers, and local politicians and entrepreneurs, knew that tenure had evolved towards something close to freehold, and that land was commonly bought and sold in the belief that such transactions conferred permanent rights (Wallace 1981, Bird 1984).

In the case of the Kano scheme the Dutch consultants originally recommended that the Government buy in the project land and treat it as a settlement scheme. In a heavily occupied area this would have been both expensive and unpopular and it was agreed the farmers concerned should receive their land back less 10%. It is not clear if they were compensated for disturbance during

construction. The disruption left many disadvantaged families, while giving opportunities to land speculators from the towns (Wallace 1981). The high-handed treatment of the farmers, failure to convey to them information on eg. the costs of the irrigation works provided, and the feeling that influential persons were able to gain advantages during the reallocation, have caused continued disgruntlement, although those who received back their land seemed by 1982 at least not to be worse off than before, if promised management services were delivered (Roy 1983). Farmers displaced by the reservoir or scheme works received either poor quality land in new villages or monetary compensation. This was eventually raised from Naira 80 to Naira 250 per acre, an unforeseen cost which was still generally insufficient to enable them to buy replacement land (Wallace 1980).

In the Bakalori operation farmers were supposed to, but did not, receive compensation for seasons when they could not farm due to construction works. This issue, plus the issue of compensation (also delayed) for those who lost land outright, led to physical obstruction organised by farmers and their traditional village leaders, close together physically and socially. This had to be quelled by military methods. At the cost of many deaths they finally received monetary compensation. After construction, the farmers were supposed to be reallocated their own land; this proved so difficult when landmarks had been destroyed that the task had to be handed over to traditional leaders, who eventually got some farming restarted, (Bird 1984).

The Dadin Kowa dam is now filling up a large area previously densely farmed. Here, lessons have been learnt, rights and boundaries have been mapped, people and their local authority leaders have been consulted over resettlement wishes, and compensation, with difficulty, has been paid. One problem has been that one of the States involved pays compensation for land itself, as this has long been legally sold (Tiffen 1976) while the others pay only for improvements (Bird 1984, Griffith 1982).

There is no evidence in the literature that the cost-benefit analysis of these large-scale Nigerian schemes took proper account of the with/without project situation. In most cases, the land

flooded by the reservoir was already farmed one season, and was large in proportion to the area developed for irrigation. Further, the dams for both Bakalori and Kano are known to have damaged or halted cultivation of rice and vegetables on flood recession land and valley bottoms downstream. Because of failure to consider land-use outside the project area more production may have been lost than gained, (Stock 1977, Adams W 1983).

#### 4.3 ISSUES NEEDING ATTENTION AT FEASIBILITY STUDY STAGE

Several important issues are involved:

a ) The need to consider land use in the with/without project situation, taking into account down-river effects and the reservoir area. Ruthenburg (1980) queries the economics of some Asian tank schemes with ratios of reservoir to irrigated area of 1:4. The Nigerian schemes quoted above have far lower ratios, eg. Kano, 58,000 acres irrigated from the Tiga reservoir covering 44,000 acres (Wallace 1981).

b) Is it politically possible to ignore a situation in which people for many years have acted as if they owned land, bought and sold it, believed securely in their rights to pass it to their heirs etc., on the grounds that traditionally the local ruler 'owned' it and the peasant has only usufructuary rights? As a President of a Rural Council said in Senegal: "Au Fouta, il y a la loi sur la domaine national, mais il y a aussi les faits." (Mathieu 1983a). In Nigeria local realities had to be recognised, at the cost of unexpectedly high levels of compensation. It is never enough in feasibility studies to accept the assurances of central governments on the state's legal rights without also ascertaining on the ground local views, though there are obvious diplomatic difficulties.

c) It is necessary to incorporate provision for compensation and the cost of resettlement in the initial economic and financial plan. This is often not done, either because it may adversely affect the calculations on economic viability, or because it is felt to be the responsibility of the national government. As a result, money is

simply not available, or arrives in very delayed fashion, for farmers who are in immediate need because they have lost their livelihood (Bird 1983).

d) There are rarely either up-to-date population figures or cadastral maps. Time must be allowed during the planning stage for the collection of this information if resettlement is to go smoothly. The collection of this data can be quite expensive if it means special surveys by expatriate consultancy companies, though it can be done efficiently in some countries by local administrators working with the local authorities, (as in Sudan).

e) It is necessary to consider if the population to farm the irrigated area will retain land and assets off-scheme which may affect labour availability.

f) Pastoralists' rights have usually either not been compensated, or compensated by the offer of a tenancy. Only occasionally, as in the case of the Afars, are the nomads in a political situation at least to get discussion of other forms of compensation, (Harbeson 1975). However, small monetary payments for loss of grazing rights to schemes taking over land for state or commercial farms have been made in Senegal (Mathieu 1983b).

#### 4.4 SETTLEMENT SCHEME PLANNING

The typical African irrigation scheme has been modelled on the Gezira, with annual, standard-sized tenancies. Having either bought out or ignored local rights, it then becomes necessary to make decisions on tenancy selection criteria, tenancy size, and housing and infrastructure provision.

##### 4.4.1 Tenancy selection criteria

Tenant selection in the Sudan is normally, as we have seen, done by giving priority to owners of land and grazing rights, provided they meet certain conditions on age, willingness to work the

tenancy, etc. Large landowners can register more than one tenancy under the names of dependants and relatives. Next come local landless labourers with agricultural experience. Outsiders may be offered any remaining holdings. Selection is done in co-operation with leading sheikhs and local authorities. The main exception has been Khasm el Girba (New Halfa) where the displaced Nubians were given tenancies as compensation regardless of the usual conditions, (Adam 1971, Benedict 1982, Gaitskell 1959, Khalil 1970, Person 1980, Salam 1979, Taha 1975 and others). Once landowners nominate a relative or landless labourer to a tenancy the person concerned should receive a legal contract with the irrigating authority, which reduces his former social dependence, and substitutes dependence on the management (Gaitskell 1959, Salam 1979, Barnett 1977, Beer 1953). Village Production Councils have a voice in the selection of new tenants (Beer 1953).

In Kenya, most schemes, particularly those managed by the National Irrigation Board, are intended to select tenants from the landless, so easing population pressure on overcrowded quality rainfed land, (ILO 1972, Chambers and Moris 1973, Fitter 1983). South Kano is exceptional in that it was planned to provide for those with existing land rights. As already noted, early schemes were set up to cater for Mau Mau detainees, particularly Kikuyu, setting them in non-Kikuyu land. Since 1960 new tenants have come from the local district. Clan elders select them, supposedly on the basis of landlessness and joblessness. They are recommended to select married men aged 35-40, (Veen in Chambers and Moris 1973). Many of the small schemes set up by voluntary agencies cater especially for cattle owners destituted by drought, who live in adjacent areas (Hillmann 1980, Kortenhorst 1983, Brown 1980). Often the main requirement is destitution - difficult to prove or quantify.

The very large Office du Niger scheme, in a very sparsely populated area, has never been able to be selective on tenants. Originally they were recruited from the whole of francophone west Africa, often using compulsion. After 1945 compulsion was withdrawn, and many departed 1950-63 (De Wilde 1967, Zahan 1963). Since independence settlers have been Mali nationals. There is little information on criteria for selection on most large schemes in

francophone Africa. In Kou, Upper Volta, migration was incited by broadcasts, and achieved 940 families 1967-78. These took up all the irrigable land (it was originally designed for 1200 families, but some land was lost by poor drainage). The immigrants, mainly Mossi, were supposed to have 4 active workers per family; this condition had to be waived for the 250 families originally living in the area. Even so there is a fluctuating participation of less than 100 of these families as they have other interests. (Ouedrago 1979, Hartog 1979). In Niger, the order of priority is 1. original occupants of the land, 2. professional farmers, 3. traders, officials etc (Cisse 1983).

#### 4.4.2 Tenancy size

On most large schemes in anglophone countries, the tenancy size is standardised. Equity of income distribution may be the objective. The size varies from .1 ha to several ha, and is given in most of the literature on the schemes. It may be determined by calculating the area necessary to yield, from a fixed cropping pattern, an income sufficient to stop urban drift. Alternatively, it is planned to be workable by the family without resorting to hired labour. In either case it is normally assumed the families have no off-scheme interests. Zimbabwe is an exception with some vegetable micro-plots intended to supplement other activities, (Makadho 1984). The large Gezira holding was planned to incorporate fallow, for reasons of fertility and crop hygiene, as water rather than land was the scarce factor. Most later schemes have been planned for more intensive production. In Sudan recent schemes have assumed mechanisation, because of labour shortage, so holding size has remained relatively large. The literature shows that planners have frequently over-estimated income levels and under-estimated labour requirements and the willingness/availability of all family members for farm work. Not much has been found on criteria for holding size in francophone countries. There does, however, seem to be more provision for size to vary according to family labour capacity. (de Wilde 1967 re Office du Niger Mali; Moris, Thon and Norman 1984 re ONAHA schemes in Niger)

#### 4.4.3 Provision of housing and village amenities

This is not always necessary. In the first phase of the Gezira, the population remained in existing villages, canals taking slight

detours if need be. However, quite frequently, housing has been built for the tenants, or tenants have been given loans to build houses. This immediately raises the issue of the ownership of the house if the tenant is on a yearly lease subject to eviction for bad cultivation. As we have seen, almost all African customary law recognizes a man's right to his 'improvements', and the possible conflict with settlement disciplinary policy was raised by Rowling 1952, but not faced.

In the Sudan, the minimum has normally been done. Existing villages, if any, have usually been incorporated, and additional ones laid out with plots. The displaced Wadi Halfans got some village amenities and two room concrete houses. They found the latter overcrowded, but the design did not make it easy to add rooms (Heinritz 1972). In the same area the nomad tenants got no housing or services, only some timber for construction (Pearson 1980). On the Rahad, village areas were laid out and landless labourers and nomads were given a plot and a small grant (LS 50) to build a house. The planners tried to reflect the original social groupings in the villages, but it was not always possible (Benedict 1982).

In the Office du Mali, the tenant received housing and equipment on credit; it was originally envisaged he would receive a permanent occupation permit after ten years, but instead the land was nationalised (De Wilde 1967). The cultivation right is transferable by inheritance, but many settlers in fact leave after some years, abandoning their houses. In planning settlements the Office tried to group settlers by tribe (Zahan 1963). In Kou, Upper Volta, a badly built house of 8.4 x 3.5 metres was provided for the typical family of 8.5, leading to overcrowding, (Ouedraogo 1979).

In Kenya, Mwea was conceived as a piece of social engineering. Clans were deliberately mixed in the villages, which created some social problems. Till 1964 housing was provided. After 1964 there was a system of loans repayable in 3 years whereby a better standard house was built for the tenant. In 1970 the terms, and the house, were improved, but people off-scheme could get longer term loans for their own designs (Chambers and Moris 1973).

On Ahero, housing was built for all tenants, incorporating the existing villages (Boodhoo and Fuller 1981). However, many of the new settlers were not accustomed to living in concentrated settlements and resented all the rules and regulations. Over time they opportunistically reorganised the houses, spacing them further apart, using indigenous material, growing vegetables on field bunds and keeping cattle nearby (Baum and Migot-Adholla 1982).

In Nigeria, at Bakalori, where a substantial market town was drowned by the reservoir, (Wallace 1981), people were moved on time to new sites, but there was no provision for economic life. There was no water, no fuel, and compensation was delayed. By the time people had secured their compensation by direct action, a third of the resettlement villages had been abandoned, as people had cut their losses and moved (Bird 1983).

#### 4.5 ISSUES ARISING IN PLANNING SETTLEMENT SCHEMES

If it is necessary to provide new villages, several difficult questions have to be faced, such as whether to try to integrate people of several tribes, or to soften the blow of translocation by keeping social groups together. On housing it has to be decided whether to build an 'improved' house, whether indeed to give nothing, on the grounds people normally build for themselves, or whether to help them do this by a loan. Underlying these issues is the question whether security of ownership of the house can be combined with an insecure annual agricultural tenancy. There are very important issues to consider in tenant selection criteria and choice of tenancy size:

Is there a clear understanding of scheme objectives and the relationship of this to tenant selection criteria? The best discussion of this is in Clayton 1978. The target of a high farmer income will reduce the number of settlers and the impact on the unemployed. Lower incomes may not halt urban drift (ILO 1972 on this conflict). Maximum production needs experienced farmers, and the landless/unemployed are often young with non-farming backgrounds. Because they are young, they have small families, therefore not enough family labour for the tenancy.

It is not often considered whether, given human variety, it is justifiable to plan for uniform holding size. It is a statistical inevitability that there will be below average farmers, and these may absorb a disproportionate amount of management time if they cannot be given a smaller holding (Tiffen 1984b).

One of the objectives may be equity of income distribution but Clayton has shown there is a spread of income within schemes in Kenya, and farmers accept this as reflecting different family attributes (Clayton 1978). There is also a very wide range of incomes on the Gezira (Salam 1979).

Many of the issues raised in this chapter assume a settlement type scheme. The question whether this organisational type is desirable is raised in Chapter 5, where the management implications of tenancy schemes are considered.

## 5. TENURE AND MANAGEMENT ON SETTLEMENT SCHEMES

Settlement schemes are those where land as well as water resources are owned or controlled by the scheme authority, and on which farmers have the status of tenants, obliged to follow orders in respect of most important farming activities.

### 5.1 JUSTIFICATIONS FOR SETTLEMENT SYSTEMS

The usual justification for this arrangement is that the state, or a commercial company, is providing important and expensive assets, and must be able to ensure that they are used in a manner that will ensure high yields and a good economic return (Tuckett 1977). Usually, in Africa, the farmers for whom the schemes are intended have no experience of irrigation, so it is felt essential that they farm under direction, at least in the initial years. In practice, the teaching period gets extended for decades. A settlement scheme enables rules on cropping patterns, irrigation practices, rotations and cultural methods, timing of operations etc., to be enforced. Frequently marketing has to be through specified outlets, so that the authority can recover loans, water and maintenance charges, etc. Part of the rationale for the authoritarianism of management, as in Mwea, is that in irrigation timeliness and effective crisis management is all important (Chambers and Moris 1973).

The undoubted complexity of water delivery, maintenance and repair, cost recovery etc. means that it is normally much simpler to entrust these functions to a new state agency than to assist farmers to set up their own institutions and to provide them with tuition. This is especially so in cases where the advantages of irrigation are not clear to the farmers, when there is need for some coercion to make them take up irrigable land, and to farm it intensively. This was frequently the case in some systems introduced in areas of low population density where rainfed agriculture remained a viable alternative.

The settlement schemes give planners further advantages. Plot layout can be decided by technical requirements, rather than by existing ownership patterns. The size can be controlled according to the scheme objectives. Suitable tenants can be selected, instead

of relying on those already there, (Palmer-Jones 1981 summarises the advantages quoted by advocates of settlement). The system should theoretically also facilitate bulk-buying, low marketing costs and low administrative costs (El Hadari 1972).

The structure of the settlement scheme is supposed also to prevent fragmentation of holdings by inheritance, and to protect the tenant from unwisely mortgaging his land and losing it by indebtedness (Gaitskell 1959).

## 5.2 RIGHTS AND DUTIES OF TENANTS AND MANAGEMENT

### 5.2.1 Degree of formalisation

In the Gezira the tenant had a written agreement, which he signed annually until 1950. By then tradition implied continued renewal, if the tenant had kept to the terms (El Hadari 1983). An initial written agreement has been the general model in the Sudan, though, as we have seen, it was not always signed if tenants disputed the terms (Pearson 1980). Tenants have individual accounts they are entitled to inspect.

It is rarely clear in the literature on other anglophone countries how the terms of his lease were conveyed to the tenant, and whether or not he had an individual written agreement, and what occurred if changes were made in the conditions of the tenancy. Tenants on the CDC scheme at Vuvulane in Swaziland certainly had a lease, which provided for increases to be made in rents at the end of ten years (Tuckett 1977). In Kenya all settlement schemes run by the National Irrigation Board come under the Trust Land (Irrigation Areas) Rules of 1962 and the Irrigation Act of 1966, which give the scheme management powers to control virtually all economic activity. Separate accounts are maintained for each tenant (Fitter 1983).

In some francophone countries the legal contracts are with co-operatives (see below). However, in the case of an irrigated palm plantation in Benin peasants were said not to be clear whether it was functioning as a co-operative or as a state farm which should pay them wages (Dissou 1983). In Upper Volta all land equipped with irrigation automatically becomes state land. The allocation to peasants fail to make clear the legal position on

improvements.

### 5.2.2 Duties of tenants

The Vuvulane scheme seems fairly typical in the powers given to the irrigating authority. The management could "define standards and .. issue instructions to cover:

Strict control over livestock and grazing areas

Construction, maintenance or demolition of buildings, roads, canals, drains and other structures

Use of vehicles

Prevention and control of pests, diseases, fire and soil erosion

Maintenance of boundary beacons

Sanitary arrangements and hygiene

Agricultural methods and practices in general" (Tuckett, 1977).

As in the archetypal Gezira, management invariably decides crops, cropping patterns and cultural practices for at least the main crop. Almost all schemes

require the main crop to be marketed through the authority; in the case of one crop schemes like Mwea, this meant control of all marketing.

In francophone Africa the tenant is commonly obliged to become a member of a co-operative. The authority deals with the heads of the co-operatives. This pattern was initiated by the Office du Niger (De Wilde 1967). On the large Senegalese schemes the co-operatives were at first the means by which the authority, SAED, could distribute inputs and market outputs. However, they have evolved to permit closer control. Peasants are formed into 'groupements de producteurs' of 12 - 20 farmers and equipped with animal power. One SAED employee supervises two groups. A legal contract links the peasant to the group and the group to SAED. The duties of peasants are to prepare seedbeds, sow in line, weed, maintain, and to repay collectively the debts of all members. SAED must provide water control, execute the necessary cultural operations, and assure the supply of factors of production and advice (Diagne 1979). In Niger the co-operatives are formally responsible for planning all agricultural operations, and for irrigation operation and maintenance. The land and the permanent infrastructure belong to

the state, but are put at the disposition of the co-operative. In practice, the Director of the Scheme, an employee of the national authority for irrigation (ONAHA) is the key person. In November 1982 a national seminar recommended that more functions be delegated to the co-operative officers, but that the staff should continue to be responsible for the cropping plan, calculation of dues and management of funds (Cisse 1983).

The functions of the management authority everywhere include the delivery of water. Schemes vary as to whether management is also responsible for mechanised operations. This is most frequently the case with rice and sugar schemes, e.g. Mwea, Vuvulane. The evolution in the Sudan has been for management to perform more and more of the agricultural functions.

#### 5.2.3. SANCTIONS FOR NON-PERFORMANCE

Formally, the main sanction for non-performance of work by the tenant is eviction. The need for this sanction is one of the main justifications of the tenancy system. It is, however, difficult to evict if the political system gives tenants some leverage or if it is difficult to replace tenants. When management tried to evict some 500 tenants from New Halfa after years of poor performance protests secured the return of most to the holder or a relative (Pearson 1977). In the Gezira management could enter the tenancy to perform the neglected function, charging costs to the tenant's account (Salam 1979). In Mwea, there is a series of warning letters and fines before eviction (Clayton 1978). In Senegal tenants have been dismissed although the failure of the rice crop was at least partially due to a strike by tractor drivers (Bonnefond and Caneil 1981). Generally, management has a legal right to punish tenants for non-performance while tenants can at best exert informal pressures on management to reduce charges when services are not delivered.

#### 5.2.4 Methods of charging tenants for management services.

The Gezira system of rewarding management by a share of the main crop was followed on schemes initiated in the 60's, but changed to fixed charges for land and water in the 1970's (Ebrahim 1983). The sharing system had the advantages of providing an incentive for management efficiency, and meant that management shared with tenants the risks of low prices, losses from disease, etc. This was particularly important in the 1930s (Thornton 1972). The fixed price system means that the tenant carries the whole burden of risk (Benedict 1982). The drawback of the cotton sharing system became apparent when other cash crops entered the rotation in the 1960s. As tenants paid only on their cotton, they gave preference to the other crops. The pros and cons of extending the sharing system to other crops and of rental systems are discussed in Salam 1979 and

El Hadari 1972.

Tenants on NIB schemes in Kenya pay a combined land and water charge which varies from scheme to scheme, but which is theoretically calculated to cover current expenditure and to make a contribution to investment costs. In fact it has to be fixed in relation to the tenant's need of a minimum income, and only at Mwea is it high enough to cover these costs (Fitter 1983).

Tenants may also have to pay for other services such as tractor ploughing, crop spraying, fertiliser application, etc. In some cases these are compulsory, and are automatically deducted from the tenants' account (e.g. Mwea, Gezira, Rahad, large schemes in Senegal). In a few cases, tenants have the option of asking management for them, or making their own arrangements (e.g. for some services at Vuvulane - Tuckett 1977). In the Gezira, management supplied tractor services for cotton, but tenants could and did hire tractors from other sources for their other crops. Gezira tenants were charged a standard rate for these services i.e. it made no difference if they had one or two crop sprays, light or heavy ploughing (Salam, 1979). The complications of the charging system, and the standardisation, made it very difficult for tenants to see any relationships between inputs and income, as noted both in the Gezira and Mwea by several observers.

### 5.3 ATTITUDES OF TENANTS TO THEIR STATUS

Tenant is a misleading word to describe the status of a man on an irrigated settlement scheme. His obligations are not limited to payment of rent and certain conditions on maintaining the farm in good order, etc. but include the acceptance of detailed orders. It has been said that farmers on large Senegalese schemes "could best be called labourers, if only their position offered them the security of a wage" (Diemer and van der Laan 1983). The decision-making sphere of Gezira and Rahad tenants on controlled crops is limited to whether to work themselves, or to hire others to work for them (Gaitskell 1959, Barnett 1977, Salam 1979, Benedict 1982).

The word tenant carries connotations of inferiority that is often not acceptable. The reason tenants refused to sign the annual

agreement on the Gezira in 1950 was that they wanted the word tenant changed to partner. (Gaitskell 1959). However, the acceptability of the status is best measured by the level of demand for scheme land, rates of turnover, etc. It can also be analysed by looking at points of dispute between management and tenants.

### 5.3.1 Demand for scheme land

This is clearly related to income levels. Gaitskell 1959 notes that tenancies had to be given to immigrants during the depression; this aroused resentment amongst the locals in the early 1950s when incomes were high and tenancies in demand. In the 1970s, when incomes were again low, El Hadari found that only about 20% of existing tenants desired a tenancy for their sons, but they themselves valued it because being old and uneducated they did not have other income-earning options. The question of other opportunities is important; demand for tenancies is high in Kenya because of land shortage (Fitter 1983). Clayton 1978 found there were more 'discipline' problems on Mwea when incomes were low. The Perkerra scheme has had low incomes and high turnover (Chambers 1973). There are indications that settlers on the Office du Niger abandon old areas as yields fall and move to newly developed virgin soils (De Wilde 1967). In Kou, Upper Volta, the number of local participants was low and fluctuating, compared with the immigrant settlers, because the locals had access to rainfed farms and livestock (Ouedrago 1979).

### 5.3.2 Campaigns for changes in terms

Main opposition to management focusses on five issues :

#### a. Rights at termination of the tenancy by death or dismissal.

Tenants at Mwea demanded the right to nominate a successor and this was conceded by management to lessen tenant antipathy to the annual nature of his licence (Giglioli 1965). Tenants in Swaziland delayed signing their leases till they got satisfaction on inheritance rights for one of their children and compensation for improvements in the event of eviction (Tuckett 1977).

#### b. Money issues and control of marketing

It has been observed in Kenya that tenants' suspicions focus on money management, prices and tenant accounts. This was noted quite

early in Mwea (Chambers and Moris 1974) and has led to production boycotts and 'black market' sales on other schemes (Fitter 1983). The 1946 tenants' strike in the Gezira was triggered by their discovery that some of the proceeds of wartime sales had been paid into a Reserve Fund (Gaitskell 1959). Vuvulane farmers insisted on payment for actual sucrose delivered, although CDC thought it fairer to pay on average sucrose content. They persistently refused collective marketing arrangements for their other crops (Tuckett 1977). In Upper Volta peasants left an official scheme producing green beans for export partly because of management failures in delivery of services, but also because they felt able to get better prices for themselves. They bought pumps and established private farms (D'at de St. Foulc 1983).

#### c. Alternative crops, additional crops

Linked to the marketing issue, tenant farmers are often at odds with management over which crop to devote most attention to, the growing of additional crops, keeping livestock, etc. Numerous studies show that they respond to local market forces, and consider family consumption needs, while management aims to produce a certain crop according to national economic plans. Disputes occur over issues such as the growing of vegetables on field bunds, and retention of cattle contrary to scheme rules (e.g. in Kenya, Baum and Migot-Adholla 1982). In the Sudan, most observers have noted the conflict between tenants and management on the importance of sorghum, and the variable interest in official crops such as groundnuts and cotton, according to price factors (e.g. Benedict 1982, Faki 1982, all reports on Khassm el Girba/New Halfa).

#### d. Housing restrictions

In schemes where housing is provided by management, there is often resentment and evasion of rules and restrictions (Baum and Migot-Adholla 1982, Chambers and Moris 1974, Heinritz 1972).

#### e. Social facilities

On the more successful schemes, where tenants' aspirations rise beyond basic business of survival, they begin to demand schools, health clinics etc which management may not feel it is their business to provide. At the same time the scheme structure and the lack of a normal local government with its own revenue (which might

conflict with management's total control) makes it difficult for tenants to use normal mechanisms for obtaining these. The difficult relationship between the Gezira management and Village Councils from the 1940s is discussed in Salam 1979. The problem was well recognised earlier (Beer 1953) but never satisfactorily solved. The same conflict arose in Mwea (Chambers and Moris 1974). At Vuvulane, CDC at first provided schools and clinics itself, but later negotiated for the Ministries concerned to take them over (Tuckett 1977).

#### 5.4 CHANGES IN TENURE OVER TIME

Whatever the legal position, tenancies become heritable and certain other changes occur. In the Gezira there has been an increasing number of half-tenancies (sub-division being permitted to this extent but no further and an increase in the numbers held by widows and minors. In 1974 11,000 of the 95,000 tenancies were held by women, and another 600 by minors (Salam 1979). Tenants consider themselves normal land-owners, and frequently install a 'wakil' (deputy) who manages the tenancy in their absence. For crops which they market themselves, they may install a labourer paid on the share-cropping basis normal in the Middle East, (Faki 1982, Heinritz 1972, Hoyle 1977, Barnett 1977 have references to major schemes, Adam 1971 goes into more detail on types of share-cropping arrangements on private pump schemes). The 'wakil' may well pay over the tenancy revenues to several heirs, in accordance with the 'sharia' rules, but this does not seem to have been investigated. Over time the tenants become older, less able to work themselves but officially they are not allowed to reduce their holding size. On Kenyan schemes it has been reported they are unwilling to pay the going wage-rate to their sons and so lose their services (Clayton 1978). This must reduce the efficiency of farm operations. In the Gezira fathers pay the going rate to sons they want to retain (Barnett 1977).

It is suspected that informal leasing and sharecropping arrangements generally make an appearance on older schemes but this is seldom investigated. Certainly on the Nyanyadzi scheme in Zimbabwe, established in 1935, it was noted in 1981 that some registered

plot holders had rented out parts of their holding to others (Hydraulics Research Station 1981). Such a development would, of course, only occur where the scheme was offering the opportunity of earning a reasonable income.

## 5.5 MANAGEMENT IMPLICATIONS OF THE TENANCY SYSTEM

### 5.5.1 For management

In certain situations settlement scheme management can be relatively efficient. It makes it possible to have a simplified canal layout. The system can be operated with low-qualified staff, provided a good monitoring system is maintained, as at Mwea and Vuvulane (Clayton 1981, Cobban 1981) and in the Gezira (Gaitskell 1959). However, when the management system involves the delivery of many mechanised services, in situations where spare parts and fuel are difficult to obtain, the young graduates available to staff it may be faced by a task beyond their capacity (Benedict 1982).

The disadvantage of a centralised system is that any mistakes made are on a large scale (Salam 1979). Bureaucratic systems may also not be able to respond flexibly to crises, e.g. by paying higher wages, authorising overtime etc. This is particularly serious when two crops have to be fitted into the farming year and timeliness is crucial. It is perhaps significant that both the Gezira and Mwea are one season systems. Many of the unsuccessful Kenyan systems try to obtain two crops, as do the unsuccessful large schemes in Senegal. Bureaucratic management also seems to succeed with sugar.

### 5.5.2 For the tenant

It has been frequently noted that tenants assume that because government owns the land and the irrigation system, government has the duty to maintain it, (e.g. D'at de St Foulc 1983). This is particularly so on schemes that do not offer good incomes.

The same attitude conditions investment policies. The peasant is unable to invest savings in purchasing more land, which, as D'at de St. Foulc 1983 remarks, removes a dynamic found in capitalist systems. He may instead invest in livestock, but this has problems if grazing areas are restricted (Beer 1955). Fitter 1983 notes re Kenyan schemes: "tenants cannot use their holdings

for securing loans, they cannot sub-divide their holdings to provide a living for their sons, they cannot choose their place of residence or even modify their quarters without permission and there is always the threat that the tenancy may be taken away. Under these circumstances settlers view their tenancy as a means for generating income for investment in a variety of different enterprises both on and off the scheme to secure an alternative livelihood. The consequences are obvious: diversion of profits and attention towards off-scheme activities." The same attitudes have been noted in the Sudan (Salam 1979).

The system also blocks the tenant's ability to experiment with new varieties, crops or techniques, or to respond to new market opportunities. Nevertheless some experiments are made and spread, for example the new watering techniques in the Gezira (Barnett 1977).

When marketing is controlled, costs of services standardised, and payments made by instalments, it becomes quite impossible for tenants to relate inputs to outputs and to calculate financial benefits of different policies (Salam 1979, Chambers and Moris 1974).

## 5.6. ISSUES FOR CONSIDERATION

### 5.6.1 Advantages and disadvantages of settlement schemes

It is time to consider seriously whether the settlement model is essential for the introduction of irrigation in new areas. It has serious disadvantages in the complexity of functions imposed on often inexperienced management staff, and even more serious social disadvantages in cramping innovation and personal development.

Tenant status has been thought essential to instruct inexperienced farmers (5.1). There is evidence that Africans can learn new techniques very quickly when it is profitable. This was observed on the early pilot projects preceding the main Gezira scheme. It was reported in 1911 "It is wonderful to see how these novices at cotton growing have through the influence of their neighbours cultivated their own fields as well as if they had been used to cotton growing all their lives" (quoted in Gaitskell 1959). In Upper Volta farmers successfully started their own green bean

gardens after two years on a scheme (D'at de St. Foulc 1983). Farmers on the mainly unsupervised village schemes in Senegal get better yields than those on closely supervised large schemes (Diemer and van der Laan 1983). However, on the relatively successful Vuvulane scheme CDC officials felt cultivation standards would fall if 'discipline' was not enforced. As social pressures made it difficult for African staff to recommend eviction it was felt expatriate management was still necessary after 20 years (private information). Tenants did without guidance on the 30% of the plot under their own control, growing and marketing vegetables, potatoes etc, which are not inherently simpler crops to manage than sugar-cane. Could the lack of enthusiasm for intensive work on sugar be related to the sugar price?

From the 1950s there has been discussion in the Sudan about the attitude of dependence on management created by the Gezira structure, and on whether or not the tenant had the capacity to evolve into a successful entrepreneur if management relaxed control. The main activity of the Tenants Union has been to campaign for management to undertake more functions and to bear more costs, which has not been regarded as a promise of positive farming attitudes. However, the evidence of Wad-el-Naim's village farming experiment suggests that tenants can and do innovate and respond to market stimuli when allowed to do so. It is the layout of the fields and canals, and the methods of water control which make it extremely difficult to allow individual control of cropping operations on the main scheme (Swan 1983). This illustrates the importance of thinking out the direction in which it is hoped the scheme will evolve at design stage. The debate about methods to reduce dependant attitudes, and whether it was desirable, and possible, given the layout, to help the tenant evolve into a decision-taking farmer is found in Beer 1955, Gaitskell 1959, El Hadari 1972, Thornton 1972, Barnett 1977 and Salam 1979.

If it is decided to give the farmer more freedom and responsibility, the stages and methods by which this can be done need consideration. It may be possible to transfer functions to a co-operative, and it may be necessary to have a sham co-operative stage when in fact most decisions are still being taken by staff (Cisse 1983). The withdrawal of staff will not be easy.

It needs to be considered how a settlement scheme can cater for human variety, and for changing needs during the life-cycle, with the same flexibility as in unregulated tenurial systems.

What is the relationship of size of scheme to managerial structure? If it is possible to have large schemes in Asia without controlling tenure, is it not possible in Africa and more consonant with human aspirations and dignity?

5.6.2. The provision of housing, social services and the relationship to normal ministries and local governments.

While housing, or money for rebuilding, and the replacement of existing social services, are obviously required as part of the compensation for those displaced, it needs to be considered how far it is the duty of management to provide or manage these things once the settlement is established. This involves consideration of management and tenants' relationships, including their taxation position, in regard to normal central and local government services. There appears to be some move back, in some African countries, to restoring the effectiveness of local government. For example, whereas SAED in Senegal was once an all-embracing rural development agency, it has now to work alongside elected Rural Councils (Mathieu 1983). There could well be conflicts of jurisdiction and of ethos, between autocratic settlement management and elective local authorities. These issues require to be thought through, country by country, if management is to have clear terms of reference.

## 6. TENURE AND MANAGEMENT ON EXTENSION STYLE SCHEMES

On extension style schemes farmers retain their original holdings, and changes in tenure are either not made or are agreed. Irrigation methods are introduced by demonstration, teaching, and voluntary persuasion. There are a few examples.

In a scheme sponsored by Shell in south-eastern Nigeria a socio-economic study was first made. It was realised farmers feared that government would take over their land. The agronomist appointed to encourage self-help tactfully did not go on farmers' land till invited. Four families agreed to share work to convert their swamp into a fish pond, dam and two acres of irrigated rice, and made their own agreement on the division of the irrigated area (Oluwasanmi et al 1966). By 1974, despite an intervening civil war, there were 600 acres of irrigated rice (Anthonio and Ijere 1973). Similar community development methods were successful in introducing rice cultivation in northern Ghana in the 1950s. Again, villagers came to their own agreement about management and tenure (Prosser 1982).

In northern Nigeria the Dutch consultants originally recommended purchase of land and a settlement scheme in Kano. This did not happen; those farmers included in the scheme retained most of their holding. The management found it difficult to adjust: "Some farmers co-operate, but it is not satisfactory because we have to ask farmers, not tell them what to do." There was certainly an initial period when many farmers preferred to continue growing guineacorn in the rainy season, which effectively prevented wheat cultivation in the dry season, (Wallace 1981). However, by 1984 personal observation from the road suggested farmers were growing a second crop of wheat, tomatoes or onions. Sumit 1983 reported that many farmers thought that irrigated agriculture was profitable, provided they could get inputs on time. There were sometimes violent confrontations with officials if there were delays in the supply of promised seed, tractor services, etc.

In Senegal the village schemes have been essentially on the extension model, formed after requests from the peasants when they had seen a successful demonstration. Land tenure was changed, but by

agreement (Diemer and van der Laan 1983).

Occasionally, there has been no intention to change tenure, but this has happened because of inadequate preliminary investigations into social structure. The Gambia case has already been cited (Dey 1980). This can delay adoption of new practices.

On the whole, the record of extension, when tried, seems successful, provided the technique offered was genuinely profitable. There is, however, often a slow start, with only a few individuals or groups accepting the experiment initially. After three or four years adoption accelerates.

## 7. AREAS WHERE FURTHER RESEARCH IS NEEDED

There is not much in this report on francophone countries other than Senegal. This probably reflects lack of time for a full French literature search since francophone scholars seem to give more attention to land use and legal issues than anglophone ones. It is also suspected that much more literature is available on the Sudan in the Sudan. It is noticeable that the best-covered countries in this report have been Sudan, Senegal and Kenya. Additional research is almost certainly required elsewhere. In Nigeria, the initial disastrous years of large northern schemes have been well catalogued; the state of the schemes five or ten years later is not generally known.

The issues connected with water rights, water use licencing, water use monitoring, existing water use in partial control systems certainly need further investigation and consideration.

There is virtually no information on the tenure and management of large state farms, commercial estates, large private farms, or small private farms which are introducing new irrigation technology.

The connection between tenancy and a dependancy complex needs further investigation. The methods by which management can withdraw after an initial learning phase have not been considered. The investment patterns of farmers on settlement schemes seem only to have been researched in the Sudan.

Similarly, the issues of the relationship of a settlement scheme to the authorities responsible for normal local government services seem only to have been considered in the Sudan, and even there, the most challenging articles are by Beer in the 1950s.

There are a whole range of issues on the relationship between equity of income distribution, size of holding, and the retention of original land rights so as to encourage flexibility, personal responsibility and individual investment, which have not been thought through.

Other issues for consideration are listed at the end of chapters.

## LAND TENURE

**SUDAN**

## PRIVATE PUMP SCHEMES

- ## ECONOMIC ANALYSIS

## SUDAN

## PRIVATE PUMP SCHEMES

- ## LAND TENURE

**SUDAN**

- ## PLANNING

## SENEGAL

BAKEL; RICHARD TOLL

- ## COMPENSATION/IMPLEMENTATION

**NIGERIA**

BAKALORI

- ## COMPENSATION/IMPLEMENTATION

# NIGERIA

BAKALORI

- ## EVALUATION

**NIGERIA**

UBOMA

- Anthony, Q.B.O. and Ijere, M. 1973. "Uboma Development Project 1964-1972. An Appraisal of a Technical Assistance programme for Rural Development in Nigeria." Shell International Petroleum Co Ltd, 28pp. Successful community development/extension style project with small-scale irrigation as one feature. No disturbance to land tenure.

## COOPERATIVES

## UPPER VOLTA

## COMAKO

d'At De Saint Foulc, J. 1983. "Les Experiences Paysannes du Developpement des Cultures au Haute-Volta." Paper presented for the International Conference: Developpement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Illustrates peasant capacity and initiative in running own irrigated gardens outside official scheme; lack of legal clarity over ownership of land and equipment, and over-complex staffing and managerial structure on official schemes.

## LAND TENURE

## SENEGAL

## VILLAGE SCHEMES

Badiane, Alioune. 1984. "Les Petits Perimetres irrigues: une alternative dans le schema de developpement regionale de la Moyenne Vallee du Fleuve Senegal?" Warango, No.7, pp. 14-16. Conflicts in state and peasant objectives in land tenure. Rents multiply by 5 for irrigated land.

## LAND DEVELOPMENT

## RWANDA

## NYABUGAGO VALLEY

Baker, P. R. 1970. "The Introduction of Rice in Rwanda." Journal of Tropical Geography, Vol. 31, pp. 27-33. Experimental rice plots on village land hitherto uncultivated. Problems in motivating farmers.

## SOCIO ECONOMICS

## SUDAN

## GEZIRA

Barnett, Tony. 1977. The Gezira Scheme: An Illusion of Development. London: Frank Cass, 192pp. Good study of labour and credit relationships on Gezira made during a low point in the scheme's history. Bibliography.

## LAND TENURE

## KENYA

## SOUTH KANO; AHERO

Baum, A. 1983. "Socio-Economic Observations on Tenants Reactions in National Irrigation Board (NIB) Schemes in the Kano Plains, Kenya." DVWK Bulletin 8. Hamburg/Berlin: Verlag Paul Parey, pp. 71-84. Shorter version of paper below.

## PLANNING/SETTLEMENT

## KENYA

## SOUTH KANO, AHERO

Baum, G.A., Migot-Adholla, S. 1982. "South Kano Irrigation Scheme - Socio-Economic Adjustments in Rural Development Planning." Quarterly Journal of International Agriculture, Vol 21, No 1, Jan-Mar, pp. 37-51. Useful report on tenancy and housing planning and management problems; later South Kano planning tried to take more account of local custom than Ahero.

## EVALUATION

## SUDAN

## RAHAD

Benedict, Peter, et al. 1982. "Sudan: the Rahad Irrigation Project." Aid Impact Evaluation Report No. 31. USAID, Washington DC. Emphasises divergences between tenant and management aims. Details on tenancy structure, settlement policy.

## PLANNING

## TANZANIA

## VILLAGE SCHEMES

Berry, L. and R.W. Kates. 1970. "Planned Irrigation Settlement. A Study of Villages in Dodoma and Sungida Regions". Tanzania Research Paper No. 10. Bureau of Resource, Assessment and Land Use Planning, University College, Dar es Salaam. In 2 of 4 village schemes, land tenure caused problems. Major problems were also in marketing and occasional drought. Formen combine irrigation with other activities, and prefer individual management. Youth settlement failed.

## PLANNING/SETTLEMENT

## ETHIOPIA

## AWASH VALLEY

Beshah, T.W., Herbeson, J.W. 1978. "Afar Pastoralists in Transition and the Ethiopian Revolution." Journal of African Studies, Vol. 5, No. 3, pp. 249-267. Conflict between Afar attitudes to their grazing rights in their homeland and state development plans which included irrigation.

## PLANNING

## IVORY COAST

## LAKE KOSSOU

BGB International Consultants. 1969. 1) "Management Study of the Surrounding Region of Kossou Lake - Terms of Reference". 2) "Demarcation of the Study Zone (Kossou). Unpublished Consultancy Reports. Assumption of land available for displaced persons.

## LAND TENURE

## NIGERIA

## BAKALORI/DADIN KOWA

Bird, A. 1983. "The Land Issue in Large Scale Irrigation Projects: Some Problems from Northern Nigeria." In: Grove, A.T. and W.M. Adams (eds.) Irrigation in Africa: Problems and Problem Solving. Cambridge, England: African Studies Centre, University of Cambridge. See below. A less detailed version.

## RESETTLEMENT

## NIGERIA

## BAKALORI/DADIN KOWA

Bird, A. 1983. "Farmer Participation in the Planning and Implementation of Nigerian Large Scale Water Resources Schemes. Bakalori Irrigation Project and Dadin Kowa Resettlement Project Compared." Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Important paper with concrete examples of farmer opposition, compensation problems and costs, means of consultation etc in resettlement schemes. Highlights role of local authorities.

## GENERAL

## MADAGASCAR

## ANKARATRA

Bonnemaison, J. 1970. "Des Riziculteurs d'Altitude Tsarahonenana, Village de l'Ankaratra (Madagascar)" in Etudes Rurales Nos. 37-38-39. pp. 326-345. Socio-economic study with land tenure details.

## PLANNING/RESETTLEMENT

## KENYA

## AHERO

Boodhoo, M. J. and Fuller, C. 1981. "Irrigated Settlement - An Appraisal of the Ahero Pilot Irrigation Scheme in Kenya." in Manchester Papers on Development Vol. 1, No. 1, pp. 73-114. Failure to realise existing number of farmers led to their displacement.

## LAND TENURE

## CHAD

Bouquet, C. 1983. "La Maîtrise de l'Eau dans les Wadi et Polders du Lac Tchad. Etude Comparative et Prospective" Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques du l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Useful in bringing out links between traditional means of construction and system of rights and payments for developed land; conflicts with modern project development. Inadequately detailed.

## SOCIO ECONOMICS

## SUDAN

## PUMP SCHEME

Briggs, J. 1983. "Farmers' Management of Small-Scale Irrigation Schemes in Central Sudan." Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Farmers' crop strategies.

## RESETTLEMENT

## AFRICA

Brokensha, D. and Scudder, T. 1968. "Resettlement," In: Rubin, N. and Warren, W. M. (eds.) Dams in Africa. London: Frank Cass. Major work on planing and resettlement problems, based on case studies in Kariba, Volta, Aswan, Kainji.

## SOCIO ECONOMICS

## KENYA

## TURKWEEL RIVER

Brown, Elizabeth, J. 1980. Irrigation in Arid Zones - Kenya A Socio-Anthropological Survey of the Irrigation Schemes on the Turkwell River. AG: DP/KEN/78/015, consultant report, FAO, Rome. Changes within traditional family structure and social organisation induced by a settlement scheme for pastoralists.

## PLANNING

## CAMEROON

## SEMRY

Buchmann, E. 1983. "Les Aménagement Hydro-Agricoles de la SEMRY au Nord Cameroun: Contributions à une Meilleure Perception des Facteurs du Succès et d'Evolution Favourable des Grands Aménagements." Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Expatriate managed state organisation, with very directive style. No information on peasant's rights, land status.

## RESETTLEMENT

## GLOBAL

Butcher, D. A. P. 1971. An Operational Manual on Resettlement. FAO, Rome. Important guide to each step necessary in a resettlement operation, using critical path method.

## WATER LAW

## AFRICA

Caponera, Dante A. (ed.). 1979. Water Law in Selected African Countries. Rome: FAO. Legislative Study No. 17, 1. Country studies include Benin, Burundi, Ethiopia, Gabon, Kenya, Mauritius, Sierra Leone, Swaziland, Upper Volta, Zambia. Gives details of all national legislation etc. Over simplistic review of land tenure custom. Acknowledges no detailed survey of customary water law appears to have been made. Only a few countries have established priorities in water use.

## WATER LAW

## AFRICA

Caponera, D. A. (ed). 1978. "Water Laws in Moslem Countries, Volume 2." Irrigation and Drainage Paper No. 20/2, Rome, FAO. Country studies of Chad, Gambia, Mali, Mauritania, Niger, Senegal, Sudan. All give modern legislation. Best also discusses customary land and water rights.

## WATER LAW

## AFRICA

Caponera, D. A. (ed). 1973. "Water Laws in Moslem Countries, Volume 1." Irrigation and Drainage Paper No 20/1. Rome, FAO. Most accessible description of Moslem principles in respect of water and associated land rights, and different juridical schools. Second part gives country details including modern legislation. Includes Somalia.

## PLANNING

## GLOBAL

Carruthers, I. D., and N Mountstephens. 1978. "Integration of Socio-Economic and Engineering Perspectives in Irrigation Design." Paper given at: International Commission on Irrigation and Drainage, Tenth Congress, Athens. Methodology for calculating shadow prices for land and water values.

## GENERAL

## KENYA

## PERKERRA

Chambers, Robert. 1973. "The Perkerra Irrigation Scheme: A Contrasting Case," In: Chambers, R., and J. Moris (eds.) Mwea: an Irrigated Rice Settlement Scheme in Kenya. Afrika-Studien No 83, Munich, Weltforum Verlag. Historical study.

## RESETTLEMENT

## GHANA

## VOLTA

Chambers, R. (ed). 1970. The Volta River Resettlement Experience. London: Pall Mall Press. Not an irrigation scheme, but useful review of population relocation - mistakes and unexpected outcomes.

## SETTLEMENT

## AFRICA

Chambers, R. 1969. Settlement Schemes in Tropical Africa, A Study of Organisations and Development. London: RKP. Not specific to irrigation but a useful review. Main chapter on Mwea. Emphasis on administration.

## GENERAL

## KENYA

## MWEA

Chambers, R. and J. Moris (eds) 1973. Mwea - An Irrigated Rice Settlement in Kenya. Afrika-Studien No. 38, Munich, Weltforum Verlag. Standard evaluation of Mwea scheme; important chapters on land conflicts before establishment and on implications of tenancy management style. Bibliography covers mainly anglophone African irrigation schemes.

## GENERAL

## NIGERIA

Chapman, N.P. (ed.) 1984. Report of the Second Fadama Seminar held at Azare, March 6-8. Azare, Nigeria: Bauchi State Agricultural Development Programme. Collection of studies on extension style small pump programme.

## SOCIO-ECONOMIC

## GHANA

## ANLO

Chisholm, N. 1983. "Responses of Some Rural Communities in South East Ghana to Economic Recession 1982". Cambridge African Monographs 2. African Studies Centre, Cambridge University. Flexible renting, sale, pledging and inheritance arrangements on an indigenous scheme.

## GENERAL

## GHANA

## ANLO

Chisholm, N.G. "The Volta Delta and Lower River" In: A. T. Grove (ed.) The Niger and Its Neighbours. See above. Balkema, The Netherlands: forthcoming.

## MANAGEMENT CO-OPERATIVE

## NIGER

Cisse, A. A. 1983. "Développement Agricole et Participation Paysanne: Politiques d'Aménagements Hydro-Agricoles au Niger." Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de L'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Important description by the Director General of ONAHA of philosophy of co-operative management in Niger, and of practical problems involved in having state employees as scheme directors alongside co-operative management committees. State ownership of irrigated land.

MANAGEMENT, TENANTS KENYA MWEA  
 Clayton, E. 1981. "Monitoring an irrigation project: Mwea, Kenya" pp. 137-156. In: Clayton, E. and F. Petry (eds.) Monitoring Systems for Agricultural and Rural Development Projects. FAO Economic and Social Development Paper 12En. Details systems of monitoring tenant performance, discipline arrangements, payments and income.

SETTLEMENT KENYA  
 Clayton, Eric. S. 1978. "A Comparative Study of Settlement Schemes in Kenya." Occasional Paper No. 3, Agrarian Development Unit, Wye College, University of London, 60pp. Important review of achievements of main NIB schemes in Kenya, planning and management implications, tenant selection criteria, tenant motivations.

MANAGEMENT. TENANTS SWAZILAND VUVULANE  
 Cobban, E. 1981. "Monitoring a Sugar Outgrower Project: Vuvulane, Swaziland" pp. 187-203. In: Clayton, E. and F. Petry. (eds.) Monitoring systems for Agricultural and Rural Development Projects. FAO, Economic and Social Development Paper 12En. Outgrower scheme with nuclear estate. Details discipline system and monitoring of tenant performance.

LAND TENURE MAURITANIA M'BAGNE  
 Crousse, Bernard. 1983. "Logique Traditionnelle et Logique d'Etat-Conflicts de Pratiques et de Stratégies Foncières dans le Projet d'Aménagement de M'bagne en Mauritanie." Paper at Colloque International de Saint Riquier, France, "Pratiques Foncières Locales en Afrique Noire" December. Important summary of traditional Toucouleur system and new 1983 land law. Example of way lineages can be used in scheme design. Bibliography.

RESETTLEMENT SUDAN KHASHM-EL-GIRBA  
 Dafalla, H. 1975. The Nubian Exodus. London: C Hurst & Co. Important step by step description of resettlement process by the administrator chiefly concerned; original tenure system also described.

BIBLIOGRAPHY ANGLOPHONE AFRICA  
 Damson Mutizwa, Naison. 1981. "A Bibliography on Land Tenure and Management in English-Speaking African Countries; with Special Reference to Arid Land Problems." Unpublished bibliography, University of Cambridge. Good source.

SOCIO ECONOMIC GAMBIA IRRIGATED RICE  
 Dey, J. 1980. "The Socio-Economic Organisation of Farming in the Gambia and its Relevance for Agricultural Development Planning." Agricultural Administration Network Paper 7, Overseas Development Institute, London. 42pp. Important study of land rights amongst male and female compound members; sexual division of labour and the consequences of ignoring the female factor.

MANAGEMENT, CO-OPERATIVES SENEGAL SAED  
 Diagne, P.S. 1979. "Les Modèles d'Intervention de la SAED." pp. 341-346. Maîtrise de l'Espace Agraire et Développement en Afrique Tropicale. Paris: Editions de l'Office de la Recherche Scientifique et Technique Outre-Mer. Reviews SAED's strategy since 1965 and the development of 'co-operatives' and 'production groups' under central directions on the large schemes, and compares these with village schemes.

MANAGEMENT, CO-OPERATIVE                      SENEGAL                      VILLAGE SCHEMES  
 Diemer, G. and Van Der Laan, Ellen. 1983. "Using Indigenous Skills and Institutions in Small-Scale Irrigation: An Example from Senegal." Irrigation Management Network Paper 8b. Overseas Development Institute, London. Participation methods and management in village schemes.

LABOUR PROBLEMS                                      BENIN                                      OUIDAH-NORD  
 Dissou, M. 1983. "Aspects de la Participation Paysanne a l'Exploitation du Projet de la Palmeraie Irriguée du Ouidah-Nord (Sud-Benin)." Paper presented to the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Lack of labour for an imposed irrigation project. Failure to pay agreed compensation for land; inadequate food crop area. Sabotage and theft.

LANDTENURE    NIGERIA                                      ZARIA  
 Ega, Alegwu L. 1984. "Land Acquisition and Land Transfer in Zaria Villages in Nigeria." Agricultural Administration, Vol. 15, No. 2, pp. 87-100. Describes size and tenure types of both rainfed and irrigated land.

MANAGEMENT, TENANTS                              SUDAN                                      NEW HALFA, RAHAD, ES-SUKI  
 Ebrahim, Mohammed H. S. 1983. "Irrigation Projects in the Sudan: the Promise and the Reality". Journal of African Studies, Vol. 10, No. 1, pp. 2-13. Settlement arrangements, management problems and tenant incentives on 3 recent schemes.

MANAGEMENT, TENANTS                              SUDAN                                      GEZIRA  
 El Hadari, A. M. 1972. "Irrigated Agriculture in the Sudan: New Approaches to Organisation and Management." Indian Journal of Agricultural Economics, Vol. 27, No. 2, pp. 25-37. Important review of pros and cons of the old Gezira tenancy system and discussion of possible alternative tenure arrangements to give more scope for farmer autonomy; variable holding size, etc.

SOCIO ECONOMICS                                      SUDAN                                      GEZIRA  
 El Hadari, A.M. 1971. "Occupational Immobility of Tenants on the Gezira Scheme, Sudan." East African Journal of Rural Development, Vol. 4, No. 2, pp. 67-75. Length persons had been in tenancies. Attitudes to tenancies.

LAND TENURE    ETHIOPIA                                      AWASH VALLEY AUTHORITY  
 Emmanuel, H.W. 1975. "Land Tenure, Land-use, and Development in the Awash Valley - Ethiopia." Unpublished Paper. Land Tenure Centre, University of Wisconsin (LTC No. 105). An unusual case where pastoralist claims had to be seriously considered alongside the needs of settlement schemes and commercial estates.

MANAGEMENT, TENANTS                              SUDAN                                      GEZIRA  
 Faki, H. 1982. "Disparities in the Management of Resources Between Farm and National Levels in Irrigation Projects; Example of the Sudan Gezira Scheme." Agricultural Administration, Vol. 9, No. 1. Adjustment of cotton and wheat prices in economic direction would make tenant give more labour and water to cotton. Sharecropping practices.

## GENERAL

## UPPER VOLTA, NIGER, MALI

FAO. 1983. Small Scale Irrigation in Africa - Country Notes: Upper Volta - Niger - Mali. Land and Water Development Division, Food and Agricultural Organisation of the United Nations, Rome. Review of many types of full and partial control systems, with some tenure information.

## LAND TENURE

## SENEGAL

Faye, J., and M. Niang. 1979. "Une Expérience de Restructuration Agraire et d'Aménagement de l'Espace Rural." pp. 111-114. In: Maîtrise de l'Espace Agraire et Développement en Afrique Tropicale. Paris: Editions de l'Office de la Recherche Scientifique et Technique Outre-Mer. Discusses participative methods of securing the reallocation of village lands, by agreement of all concerned. Not utilised for irrigation purposes but could be applicable.

## MANAGEMENT, COMMUNAL

## KENYA

## TAITA HILLS

Fleuret, Patrick. 1984. "The Social Organisation of Water Control in the Taita Hills, Kenya." Unpublished paper. Local institutions of clanship and neighbourhood, both traditional and modern, used for maintenance organisation of an efficient supplementary irrigation system.

## PASTORALISTS

## BOTSWANA

Fortmann, Louise and Emery Roe. 1981. "Dam Groups in Botswana." Pastoral Network Paper 12b, July. London: Overseas Development Institute. Management of dams for livestock purposes.

## EVALUATION/SETTLEMENT

## KENYA

## NIB SCHEMES

Fitter, J C. 1983. "Evaluation of the Organisational Structure of Management Systems of the National Irrigation Schemes in Kenya". DVWK Bulletin 8. German Association for Water Resources and Land Improvement. Verlag Paul Parey, Hamburg/Berlin. Good source of comparative data on structure and results of Kenya's settlement schemes.

## MANAGEMENT, COMMUNAL

## SENEGAL

## MATAM

Fresson, Sylviane. 1978. "Public Participation on Village Level Irrigation Perimeters in the Matam Region of Senegal". Experiences in Rural Development, Occasional Paper No. 4. Paris: OECD Development Paper (CD/R(78)12).

## SETTLEMENT

## SUDAN

## GEZIRA

Gaitskell, Arthur. 1959. Gezira: A Story of Development in the Sudan. London: Faber and Faber. The major work on the planning and first 30 years of the Gezira. Planning methodology deserves study.

## SETTLEMENT

## KENYA

## LOYAPAT

de Gans, G. 1983. "Loyapat Irrigation Scheme (Turkana District)." Paper presented to Workshop: Small Scale Irrigation in Kenya, Nairobi, Small Scale Irrigation Branch, Kenya Ministry of Agriculture. Small scale scheme for destitute pastoralists. Problems of tenant commitment.

## SETTLEMENT

## KENYA

## KAPUTIR

de Gans, G. 1983. "Kaputir Irrigation Scheme (Turkana District)." Paper presented to Workshop: Small Scale Irrigation in Kenya. Nairobi: Small Scale Irrigation Branch, Kenya Ministry of Agriculture. As above with more co-operative management style.

## BIBLIOGRAPHIES

## AFRICA

Geller, S. 1981. Planning, Management and Participatory Development: Issues in Irrigation Projects: A Select Annotated Bibliography. Club du Sahel/CILSS. Good source.

## EVALUATION

## GHANA

## URADEP

Ghana. 1980. "Ghana: Upper Region Agricultural Development Project." In: Grove, A.T. and Adams, W.M. (eds.) Irrigation in Africa: Problems and Problem Solving. Cambridge, England: African Studies Centre, University of Cambridge. Extracts from URADEP Evaluation Report. Extension style project. No intervention in land tenure.

## MANAGEMENT, TENANTS

## KENYA

## MWEA

Giglioli, E.G. 1965. "Staff Organisation and Tenant Discipline on an Irrigated Land Settlement." East African Agriculture and Forest Journal, Vol. 30, pp. 202-5. Tenant's rights and duties described by the most influential scheme manager.

## EVALUATION

## UGANDA

## MUBUKU

Gitelson, S.A. 1971. "The Mubuku Irrigation Scheme: A Case Study." East African Journal, Vol. 8, No. 5, pp. 16-25. High costs of settlement scheme in staffing and housing; management failures.

## LAND TENURE

## GHANA

Goody, Jack. 1980. "Rice-Burning and the Green Revolution in Northern Ghana." Journal of Development Studies, Vol. 16, No. 2, pp. 136-155. Alienation of land by chiefs not always acceptable to villagers.

## MANAGEMENT, COMMUNAL

## TANZANIA

## SONJO

Gray, R. 1963. The Sonjo of Tanganyika: An Anthropological Study of an Irrigation Based Society. London: OUP. Good case study of land rights and management processes.

## PLANNING

## NIGERIA

## RIVER BASINS

Griffith, W.J. 1982. "Dadin Kowa, the Upper Benue and the TVA." Unpublished paper presented at a workshop for the Upper Benue River Basin Authority. Lists river basin duties; considers alternative resettlement options for Dadin Kowa dam oustees. Important on concepts for RBA's role.

## MANAGEMENT, COMMUNAL

## GHANA

## VOLTA DELTA

Grove, J.M.(et al). 1982. "Irrigation in the Volta Delta, Ghana." Paper presented to IGU Working Group on Resource Management in Dry Lands. Hamburg. The Anlo system. Comparison of its functioning at two different dates.

## PLANNING

## ZIMBABWE

Harbeson, J.W. 1980. "Land and Rural Development in Independent Zimbabwe: a preliminary analysis" Land Tenure Center Newsletter, No. 69. Incorporating irrigation as a factor in planned land development.

## LAND TENURE

## ETHIOPIA

## AWASH VALLEY

Harbeson, J.W. 1975. "Afar Pastoralists and Ethiopian Rural Development." Rural Africana, No. 28, pp. 71-86. An exceptional case where for political reasons grazing claims had to be considered.

## SOCIO-ECONOMICS                      UPPER VOLTA                      KOU

Hartog, T. 1979. "La Vallée du Kou: Un Exemple d'Intervention Planifiée et d'Encadrement Paysan dans l'Ouest Voltaïque," pp. 301-306. In: Maîtrise de l'Espace Agraire et Développement en Afrique Tropicale. Paris: Editions de l'Office de la Recherche Scientifique et Technique Outre-Mer. Highlights attitudes of local inhabitants, now a minority on a large scale rice scheme with different economic interests to immigrant settlers.

## MANAGEMENT/TENANTS                      SUDAN                      KHASHM-EL-GIRBA

Heinritz, G. 1972. "Social Geographic Problems in the Khashm-El-Girba Project, Sudan". Land Reform, Land Settlement and Co-operatives, No 2, pp.25-36. Important study of housing provision difficulties, conflicts of interest between management and tenants; position of landless 'westerners'.

## SOCIO-ECONOMICS (PASTORAL)                      KENYA                      TURKANA DISTRICT

Hillmann, F. 1980. "Water Harvesting in Turkana District, Kenya". ODI Pastoral Development Network Paper 10d. London: Overseas Development Institute. Extension scheme for agro-pastoralists. Problems of participation.

## SETTLEMENT (PASTORALIST)                      SUDAN                      KHASHM-EL-GIRBA

Hoyle, S. 1977. "The Khashm-El-Girba Agricultural Scheme: An Example of an Attempt to Settle Nomads" pp. 116-132. In: O'Keefe, P. and B. Wisner (eds.) Landuse and Development: African Environment Special Report No 5. London: IAI. Problems of tenant absenteeism among settled pastoralists.

## PLANNING                      KENYA

International Labour Office. 1972. Employment, Income and Equality: A Strategy for Increasing Productive Employment in Kenya. Geneva. Discusses farm incomes, farm size, employment creation.

## LAND TENURE                      SUDAN                      GEZIRA

Khalil, H.M.M. 1970. "The Sudan Gezira Scheme: Some Institutional and Administrative Aspects." Journal of Administration Overseas, Vol. 9, No. 4, pp. 273-285. Detailed analysis of why the Sudan Government leased rather than bought or appropriated land, and the later purchase of the major share of owners' residual rights.

## CO-OPERATIVES                      SUDAN

Khider, Mahassin, and Simpson, Morag C. 1962. "Co-operatives and Agricultural Development in the Sudan." Journal of Modern African Studies, Vol. 6, No. 4, pp. 509-518. Crop sharing arrangements common to both co-operative and private schemes.

## MANAGEMENT                      TANZANIA                      MOMBO

Kikaho, E. E. 1978. "Small Project Dependency on Surface Water Supply." Paper presented for the Workshop: Irrigation Management. Hyderabad, India. Government-aided farmer co-operative, with problems of participation.

## SETTLEMENT

## GHANA

## VEA

Konings, P. 1981. "Peasantry and State in Ghana: The Example of the Vea Irrigation Project in the Upper Region of Ghana." Working Paper No 5. Leiden, The Netherlands: African Studies Centre. A basically good description of years of land conflict (1968-80), made somewhat obscure by author's political stance. Dispossessed peasants eventually got some land back as tenant farmers from intervening state and commercial farms, but remained dissatisfied with their tenant status. Corruption and clientage in land allocation.

## GENERAL

## KENYA

Kortenhorst, L.F. 1983. "Workshop on Small-Scale Irrigation in Kenya - Summary Report." Wageningen: International Institute for Land Reclamation and Improvement. Review of small-scale projects. Non-irrigation interests and land tenure conflicts amongst identified problems.

## GENERAL

## AFRICA

Kortenhorst, L.F. 1980. "Factors Affecting the Viability of Smallholders Irrigation". Land Reclamation and Water Management Publication No. 27, ILRI, Wageningen. (Also ILRI Report No. 20). Land tenure conflicts and disincentive effect of tenant status are amongst the identified constraints.

## RESETTLEMENT

## GHANA

## VOLTA RIVER

Lassailly-Jacob, V. 1983. "Initiatives Paysannes et Interventions Etatiques dans la Mise en Valeur des Rives du Lac Volta au Ghana." Paper presented for International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Notes plight of downstream flood recession cultivators, unconsidered officially, who migrated to lake side and compete for land with indigenous and official resettlers. Pilot irrigation schemes, co-operative and individual.

## SOCIO-ECONOMIC, HISTORICAL

## UPPER VOLTA

## ZAONGHO

Lahuec, J.P. 1970. "Une Communauté Evolutive Mossi: Zaongho." Etudes Rurales, Vols. 37-38-39, pp. 150-172. Traces use since 1920s of bas-fonds for fruit trees, vegetables, rice and manioc, by indigenous enterprise. Differences in tenure with uplands.

## GENERAL

## SENEGAL

## SAED

Léricollais, A. 1979. "Activités Traditionnelles et Insertion dans les Casiers Irrigués de la Vallée du Sénégal," pp. 265-279. In: Maîtrise de l'Espace Agraire et Développement en Afrique Tropicale. Paris: Editions de l'Office de la Recherche Scientifique et Technique Outre-Mer. Compares recession cultivation, large schemes, village schemes. Data on holding size, large schemes.

## LAND TENURE

## SENEGAL

Le Roy, E. "Reforme Foncière et Développement: L'Exemple du Senegal." African Perspectives pp. 67-81. National law, 'mise en valeur' concepts.

## MANAGEMENT, FARM LEVEL

## SENEGAL

Linacres, O.F. 1981. "From Tidal Swamp to Inland Valley: on the Social Organisation of Wet Rice Cultivation Among the Diola of Senegal." Africa, Vol. 51, No. 2, pp. 557-595. Illustrates varying land and labour organisation in partial control systems using rain water retention and tidal swamps. Good bibliography.

## SOCIO-ECONOMICS

## AFRICA

Makadho, J.M., 1984. "A Review of Some Factors Affecting the Viability of Small Holder Irrigation Schemes in Africa." In: Blackie, M.J., (ed.) African Regional Symposium on Small Holder Irrigation. Harare, Zimbabwe: University of Zimbabwe.

## LAND TENURE

## MADAGASCAR

## BETAFO

Marchal, J.Y. 1970. "Un Exemple de Colonisation Agricole a Madagascar: Antenety-Ambohidua (Sous Prefecture de Betafo)." Etudes Rurales, Nos. 37-38-39, pp. 397-409. Important study of spontaneous recent settlement and evolution of land tenure (rice cultivation in valley bottoms).

## LAND TENURE

## SENEGAL

Mathieu, P. 1983a. "Stratégies Foncières Paysannes et Agriculture Irriguée dans la Vallée du Fleuve Sénégal." Paper presented for the Colloquium: Pratiques Foncières Locales en Afrique Noire. St Riguier. Effect of changes in national land law and introduction of irrigation on land speculation and traditional tenure systems, in Middle Valley and Lake Guiers. Bibliography.

## LAND TENURE

## SENEGAL

## LAC DE GUIERS

Mathieu, P. 1983b. "Agriculture Irriguée, Reforme Foncière, Participation Paysanne: Le Cas de la Zone du Lac de Guiers dans la Vallée du Fleuve Sénégal." Paper presented to International Conference: Developpement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Center d'Etudes Juridiques Comparatives. Important study of effect of changes in national land law, and of increased competition for irrigable land.

## LAND TENURE

## SUDAN

Miskin, A.B. 1953. "Land Registration." Journal of African Administration, Vol. 5, No. 2, pp. 72-80. Illustrates well the complications of land division amongst heirs under Moslem law and the difficulties in finding all the owners. Important in planning compensation exercises in such countries.

## MANAGEMENT

## MALI

## BLE-DIRE

Moris, J.R. 1984. "Managing Irrigation in Isolated Environments: A Case Study of Action Ble-Dire, Mali." In: Blackie, M.J., (ed.) African Regional Symposium on Small Holder Irrigation. Harare, Zimbabwe: University of Zimbabwe.

## GENERAL

## SAHEL

Moris, J.R. and Norman, Ray. 1984. "Prospects for Small-Scale Irrigation Development in the Sahel." Water Management Synthesis Report 26. Utah State University, Logan, Utah.

## GENERAL

## ZIMBABWE

Mupawose, R. 1984. "Irrigation in Zimbabwe." In: Blackie, M.J., (ed.) African Regional Symposium on Small Holder Irrigation. Harare, Zimbabwe: University of Zimbabwe. Survey of range of management systems in Zimbabwe.

## PLANNING

## ZAMBIA

## CHUNGA

Nelson-Richards, A. 1982. Social Change and Rural Development - Intervention or Participation, a Zambian Case Study. Washington DC: University Press of America. National political problems in agricultural development illustrated by Chunga irrigation scheme. Tenancy arrangements; lack of incentives.

## SOCIO-ECONOMICS

NIGERIA

UBOMA

Oluwasanmi, H.A., I.S. Dema, et al. 1966. Uboma: A Socio Economic and and Nutritional Survey of a Rural Community in Eastern Nigeria. Bude, U.K.: Geographical Publications Ltd. The detailed socio-economic survey preceding the successful Uboma project (see Anthonio et al. above) and the first year of operations. Importance of reassuring farmers on land ownership stressed. Consolidation and reallocation was by agreement worked out by concerned families.

## GENERAL

SENEGAL

O.M.V.S. (Organisation pour la Mise en Valeur du Fleuve Senegal). 1980. Etude Socio-Economique de l'O.M.V.S. 5 volumes. Dakar. Not seen. Socio-economic survey of existing agricultural and social systems - contains land tenure survey. Quoted on strict customary rights and high dues, etc. on riverain land.

## CULTIVATION METHODS

NIGERIA

SOKOTO-RIMA FLOOD BASIN

O'Reilly, F.D. 1983. "Traditional Management of Rice Cultivation in the Sokoto-Rima Irrigation Area. (N. W. Nigeria)" Unpublished paper: ODI Lunchtime Seminar Series.

## SETTLEMENT

NIGERIA

BAKALORI - HADEJIA JAM'ARE

O'Reilly, F. D. 1980. "Large Scale Irrigation Projects and Small African Farmers". Paper presented for ASAUK/IBG Conference: Recent Change in Development Theory and Africa. University of Manchester. Failures in consultation, compensation and settlement arrangements, to the disadvantage of small farmers.

## SOCIO ECONOMICS

UPPER VOLTA

KOU

Ouédraogo, D. 1979. "La Vallée du Kou (Haute Volta): un Sous-Espace Aliéné," pp. 481-490. In: Maîtrise de L'Espace Agraire et Développement en Afrique Tropicale. Paris: Editions de l'Office de la Recherche Scientifiques et Techniques Outre-Mer. Good study of problems of immigrants and natives on land taken by state for rice culture.

## SETTLEMENT

NIGERIA, NORTH

Palmer-Jones, R.W. 1983. "Mismanaging the Peasants: Some Origins of Low Productivity on Irrigation Schemes in the North of Nigeria." In: Grove, A.T., and Adams, W.M. (eds.) Irrigation in Africa: Problems and Problem Solving. Cambridge, England: African Studies Centre, University of Cambridge. Review of tenure situation and allocation procedures which give advantages to elite. Farmers have no contract rights against a management that often fails to deliver services.

## MANAGEMENT, TENANTS

NIGERIA

KWARRE

Palmer-Jones, R. 1981. "How Not to Learn from Pilot Irrigation Projects: The Nigerian Experience." Water Supply and Mangement, Vol. 5, No. 1. Important historical review of Kwarre project, 1925-1978, early neglect of real tenure situation; rationale behind blaming the lazy farmer and demanding more control when real defects were technical or economic. The false lesson learnt was the need for settlement schemes.

## SOCIO-ECONOMICS

SUDAN

NEW HALFA

Pearson, M. 1980. "Settlement of Pastoral Nomads: A Case Study of the New Halfa Irrigation Scheme in Eastern Sudan." Development Studies Occasional Paper No. 5. 60 pp. University of East Anglia. Economic reasons for lack of commitment of nomad tenants to cotton; tenancy valued for social benefits; difficulty of using eviction mechanism.

## COMMUNITY DEVELOPMENT

## GHANA

## NORTHERN REGION

Prosser, A.R.G. 1982. "Community Development: The British Experience." In: Jones, Gwyn E. and Rolls, Maurice. (eds.) Progress in Rural Extension and Community Development. John Wiley. Instigation of village rice schemes common northern Ghana in the 1950s.

## MANAGEMENT

## MADAGASCAR

## LAKE ALAOTRA

Rakoto-Ramiarantsoa, H. 1983. "Développement à Contre-Sens: Un Aménagement Hydro-Agricole qui n'a pas donné les Résultats Escompts. Réseau Hydro-Agricole du PC 23 Bird, curette du Lac Alaotra, (Madagascar)." Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Water supply problems and conflicts between management and farmers in an extension scheme.

## LAND TENURE

## NIGERIA

## KANO

Roy, Sumit. 1983. "The State and Large Scale Irrigation. Some Notes Based on Large Scale Irrigation in Kano." Paper presented to the Centre for Social and Economic Research, Ahmadu Bello University, Zaria. June. Preliminary study of peasants with and without irrigated land on or near Kano Scheme. Variations in income, attitudes and opportunities. Renting in and out practiced.

## GENERAL

## AFRICA

Ruthenburg, H. 1980. Farming Systems in the Tropics. Oxford: Clarendon Press. [Third Edition]. Good discussion of relationships between water availability, reliability and quality and land use and management in Chapter 7.

## SETTLEMENT

## SUDAN

## ES-SUKI

Salam, M.M. Abdel. 1982. "Some Developmental Issues of Settlement Schemes in the Sudan: The Case of Es-Suki." DERAP Working Paper A 260. Bergen, Norway: CHR. Michelsen Institute. Conflicts of interest between scheme management and tenants, mainly over livestock.

## MANAGEMENT, TENANTS

## SUDAN

## GEZIRA

Salam, M.M. Abdel. 1979. "The Institutional Development of the Sudan Gezira Scheme with Special Reference to the Impact on Tenant's Performance." University of Reading, UK: Ph.D thesis. Best source for management and tenant development 1950-1978 (also covers the earlier period on which Gaitskell wrote). Considers implications of management style and possible results of changes in this. Tenant incomes, practices, outside interests, etc.

## PASTORALISTS

## AFRICA

Sandford, Stephen. 1983. "Organisation and Management of Water Supplies in Tropical Africa." ILCA Research Report No. 8, Dec. Addis Ababa, Ethiopia: International Livestock Centre for Africa. Primarily concerned with livestock watering points, contains some information on ownership and control of wells and well fields. Bibliography.

## RESETTLEMENT

## AFRICA

Scudder, Thayer. 1975. "Social Impacts of Integrated River Basin Development on Local Populations." Positional paper presented at UNDP/UN International Seminar on River Basin and Interbasin Development, 16-26 September. Budapest, Hungary. Important paper summarising experience of several African resettlement projects for persons displaced by reservoirs etc, including tenure aspects, impact below dam.

## RESETTLEMENT

## AFRICA

Scudder, Thayer. 1973. "Summary: Resettlement," In: Ackerman, White and Worthington (eds.) Man Made Lakes: Their Problems and Environmental Effects. Geophysical Monograph 17. Washington DC: American Geographical Union. See above. Also emphasises need for consultation, alternative strategies for resettlement of displaced persons.

## GENERAL

## GHANA

Shepherd, A. 1981. "Agrarian Change in Northern Ghana: Public Investment, Capitalist Farming and Famine," pp. 168-192. In: Heyer, J et al. (eds.) Rural Development in Tropical Africa. London, MacMillan. Contrasts differential impact of large scale rice farming in land-plentiful and land-hungry areas.

## SETTLEMENT

## SUDAN

## JAMU'IYA

Shepherd, A.W. 1980. "The Jamu'ia Scheme: Report on a Field Project" Occasional Paper No. 8. Development Administration Group, Institute of Local Government Studies, University of Birmingham, U.K. Farmers clash with Government over development of riverain land.

## PLANNING

## NIGERIA

## RIVER BASINS

Siann, J. N. 1980. "Conflicting Interests in River Basin Planning: A Case Study." Unpublished paper presented at Seminar on River Basin Planning, Centre for Development Studies, University of Swansea, Wales. Urban needs versus agricultural needs.

## SETTLEMENT

## ETHIOPIA

Simpson, G. 1976. "Socio-Political Aspects of Settlement Schemes in Ethiopia and Their Contribution to Development". Land Reform, Land Settlement and Co-operatives, No. 2, pp. 22-41. Tenant selection by the criteria of land rights led to absenteeism by pastoralist Afar. Best written-up section on Ethiopian population.

## MANAGEMENT, TENANTS

## SUDAN

## GEZIRA

Simpson, I.G. 1976. "The Sudan Gezira Scheme: Transformation and Evolution." Paper presented for the Conference: Accelerating National Agricultural and Rural Development. Reading, England: University of Reading. Evolution over time and effects on management and tenants.

## SETTLEMENT (PASTORALIST)

## SUDAN

## KHASHM-EL-GIRBA

Sorbo, G M. 1977. "Nomads on the Scheme: A Study of Irrigation Agriculture and Pastoralism in Eastern Sudan". In: O'Keefe, P, and Wisner, B. (eds.) Land Use and Development. African Environment Special Report No 5. London: IAI. Financial problems encountered on-scheme encourage retention of off-scheme pastoralist interests.

## MANAGEMENT, COMMUNAL

## KENYA

## MARAKWET

Ssenvonga. J.W. 1981. "The Marakwet Irrigation System as a Model of a Systems-Approach to Water Management." Paper presented for the Conference: Irrigation Development in Arid and Semi-Arid Areas of Kenya. Limuru, Kenya. Important description of traditional water rights system. Discusses potential conflicts with modern institutions.

## PLANNING

## NIGERIA

## TIGA DAM, KANO

Stock, Robert F. 1977. "The Impact of the Decline of the Hadejia River Floods in Hadejia Emirate," pp. 141-146. In: van Apeldoorn, G. Jan. (ed.) The Aftermath of the 1972-74 Drought in Nigeria. Proceedings of a Conference held at Baganda. Zaria, Nigeria: Federal Department of Water Resources and the Centre for Social and Economic Research, Ahmadu Bello University. Important study of impact of new dam on partial control systems and shaduf irrigators on farms established by both immigrant and local farmers. Out-migration, and psychologically as well as physically destructive effects.

## MANAGEMENT, TENANTS

## SUDAN

## GEZIRA

Swan, C.H. 1983. "Relations Between Management, Government and Tenants with Respect to Irrigation Water in Gezira, Sudan." Paper presented for the International Conference: Developpement Agricole et Participation Paysanne. Une Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Recent changes in Gezira, and in-built rigidities.

## SETTLEMENT

## SUDAN

## GEZIRA

Taha, T.E.J. 1975. "The Development of the Managil South-Western Extension of the Gezira Scheme, Sudan". Paper presented to: EDI/IBRD Sudan Agricultural Development Projects Seminar. Sudan: University of Khartoum. Settlement scheme for Gezira labourers, with modified Gezira-type management and tenancy system.

## PLANNING

## SUDAN

## GEZIRA

Thornton, D.S. 1972. "Agricultural Development in the Sudan Gezira Scheme." Tropical Agriculture, (Trinidad) Vol 49, No. 2, April. University of the West Indies. Important policy discussion of pros and cons of moving towards more centralised direction or more entrepreneurship by tenant. Management and tenants' capacity for these choices.

## RESETTLEMENT

## SUDAN

## KHASHM EL GIRBA (NEW HALFA)

Thornton, D.S., and R F Wynn. 1968. "An Economic Assessment of the Sudan's Khashm el Girba Scheme." East African Journal of Rural Development, Vol. 1, No. 2, July. Economic analysis at a very early stage in scheme's life: also contains tenancy and compensation terms.

## MANAGEMENT, GENERAL

## AFRICA

Tiffen, Mary. 1984a. "Human Resources in African Irrigation." pp. 57-73. In: Blackie, M.J. (ed.) African Regional Symposium on Smallholder Irrigation. U.K.: Overseas Development Unit of Hydraulic Research. General recommendations for incorporating the interests of tenants/farmers in irrigation management structures.

## LAND TENURE

## NIGERIA

## BAUCHI

Tiffen, Mary. 1984b. "Notes on Vegetable Marketing and Processing, and Land Tenure in Azare and Adjacent Areas". In: Chapman, N.P. (ed.) Report for the Second Fadama Seminar, Azare, 6-8 March. Bauchi State Agricultural Development Programme, Northern Zone, Nigeria. Tenurial status of flood plain land.

## GENERAL

## KENYA

## MACHAKOS

Tiffen, Mary. 1983. "Peasant Participation in District Water Planning. An Example from Machakos District, Kenya." Paper presented for the International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Structure of self help groups and representative organisations; failure of an internationally aided central government project to use existing channels for consultation and participative management.

## MANAGEMENT, TENANTS,

## SWAZILAND

## VUVULANE

Tuckett, J.R. 1977. "Vuvulane Irrigation Farms, Swaziland: a Report on the First Ten Years." Agricultural Administration, Vol. 4, No. 2. Important description of rights for which tenants battled, in a situation where they had some political leverage. (The author describes this in terms of management difficulties).

## LAND USE

## NIGERIA

## SAVANNA

Turner, B. 1977. "The Fadama Lands of Central Northern Nigeria." Ph.D thesis, University of London. Good study of varying landuse of wetland in northern Nigeria, according to market and population factors. Some information on land values.

## MANAGEMENT, TENANTS

## KENYA

## AHERO

Walker, H.H. Castell, Wolfgang Graf zu, 1979. "The Contribution of Organisation Analysis to the Appraisal of Development Projects - the Example of the Ahero Pilot Irrigation Scheme in Kenya". Zeitschrift fur Ausländische Landwirtschaft, Vol. 18, No. 1, pp. 49-68. Evaluation of organisational structure and goals.

## LAND TENURE

## NIGERIA

## KANO RIVER

Wallace, T. 1981. "The Kano River Project, Nigeria: The Impact of an Irrigation Scheme on Productivity and Welfare," pp. 281-306. In: Heyer, J. et al (eds.) Rural Development in Tropical Africa. London: MacMillan. Discusses political constraints on governments ability to appropriate land. Even for owners, irrigated agriculture necessitates more inputs, more risk, favours the richer ones.

## LAND TENURE

## NIGERIA, NORTH

Wallace, T. 1980. "Agricultural Projects and Land in Northern Nigeria" Review of African Political Economy, No 17, Jan-April, pp59-70. Good review of suffering caused by inadequate compensation and resettlement policies; impoverishment of farmers losing land permanently or temporarily, or losing water downstream.

## LAND TENURE

## SENEGAL

## BAKEL REGION

Weigel, J.Y. 1983. "Irrigation et Participation Paysanne dans la Région de Bakel (Vallée du Senegal)." Paper presented at International Conference: Développement Agricole et Participation Paysanne. Un Exemple: Les Politiques de l'Eau en Afrique. University of Paris I, Centre d'Etudes Juridiques Comparatives. Preliminary assessment of effect of irrigation plots on traditional power and tenure relationships; notes formation of peasant federation to secure management rights from SAED (specific to Soninke/Bakel area).

## SOCIO-ECONOMICS

## SENEGAL

## BAKEL REGION

Weigel, J.Y. 1981. "Bilan Socio-Economic de l'Irrigation dans la Région de Bakel." Etudes Scientifiques, December. See above.

## SETTLEMENT

## KENYA, MALI

## OFFICE DU NIGER

## MWEA/PERKERRA

de Wilde (et al). 1967. Experiences with Agricultural Development in Tropical Africa Vol 2. USA, Baltimore: John Hopkins Press. Chapter 7: "Observations on Some Irrigation Schemes". pp. 221-240. Chapter 1: "Mali: The Office du Niger - An Experience with Irrigated Agriculture" pp. 245-300. Contains important historical review of Office du Niger, and its always unsatisfactory tenancy and settlement arrangements. Chapter 7 compares tenancy relations Mwea and Perkerra emphasising importance of economic incentive and persuasion rather than coercion.

## SETTLEMENT

## NIGERIA

## KANO RIVER

Yusuf, A. B. 1978. "Kano River Project Phase II: Rural Sociology. Specialist's Report: Hadegia-Jama'are River Basin Development Authority." (Unpublished consultants report). Report unclear whether people have only customary rights of occupancy, as stated in one section, while another section reports it as heritable, and acquired by gift, sale, pledge, lease, etc.

## SETTLEMENT

## MALI

## OFFICE DU NIGER

Zahan, Dominique. 1963. "Problèmes Sociaux Posés par la Transplantation des Mossi sur les Terres Irriguées de l'Office du Niger." pp. 392-403. In: Biebuyck, Daniel. (ed.) African Agrarian Systems. Oxford University Press (for the International African Institute). Strains caused in extended family and marriage systems of Mossi by resettlement.

Since this paper was first written the papers presented for the International Conference: 'Développement Agricole et Participation Paysanne. Un exemple: Les publiques de l'Eau en Afrique' have been published as G. Conac (ed), Les politiques de l'eau en Afrique, Editions ECONOMICA, Paris 1985.

## APPENDIX 2 BIBLIOGRAPHY FOR AFRICAN LAND TENURE AND GENERAL PROPERTY CONCEPTS

Afrika-Studiecentrum. 1979. "La Reforme Agro-Foncière dans Les Pays du Conseil de l'Entente en Afrique de l'Ouest." African Perspectives, Vol. 1. Leiden, Netherlands: Afrika-Studiecentrum.

AISJ (Association Internationale des Sciences Juridiques). 1971. Le Droit de la Terre en Afrique (au Sud du Sahara). Paris: Editions G-P Maisonneuves et Larose.

Anderson, T. J. 1976. Land Tenure and Agrarian Reform in Africa and the Near East: An Annotated Bibliography. Boston, Massachusetts: GIC Hall and Co.

Biebuyek, Daniel (ed.). 1963. African Agrarian Systems. International African Institute, Oxford University Press. Biebuyek's introduction is a good summary (in French) of types of tenure, their complexity, and the capacity for evolution and change. These changes are frequently demonstrated in the case studies.

Coward, E. W. 1983. "Property in Action - Alternatives for Irrigation Investment." Paper presented for the Workshop: Water Management and Policy. Khon Kaen University, Thailand.

Damont, Rene. 1966. False Start in Africa. Sphere Books/Andre Deutsch. Influential book (published in French in 1962) by an agronomist. In favour of intermediate technology, and small scale development. However, his fears for land degeneration and the need for good returns conditioned his views on land tenure and the need for massive education and sound leadership of "ignorant and lazy African peasants".

Etudes Rurales. 1970. Nos. 37-38-39, Jan-Sept. Contains over 20 articles describing agrarian structure of diverse African and Malagasy villages, carried out 1962-69. Basic approach was to map area, and make observations and enquiries during year's stay. Most contain land tenure details, often in historical perspective.

FAO. 1970. Bibliography on Land Tenure in Africa. Rome: FAO (Rural Institutions Division).

Gasse, V. 1971. Les Régimes Fonciers Africains et Malagaches- Evaluation Depuis l'Indépendance. Paris: LGDJ.

Gershenberg, I. 1971. "Customary Land Tenure as a Constraint on Agricultural Development - A Re-Evaluation." East Africa Journal of Rural Development, Vol. 4, No. 1. Shows customary tenure to be very flexible - where land is well used for cash crops.

Little, K. L. 1951. The Mende of Sierra Leone. Routledge and Kegan Paul. Ch. IV Rice Farming and Land Tenure. Deals mainly with upland rice. Important for explaining concepts of land management by head of lineage and rights of users; inheritance laws; class stratifications owing to social origin as warrior or captive, which are also found in other related societies in W Africa and which still affect attitudes to land.

Masefield, G. B. 1952. "Farming Systems and Land Tenure." Journal of African Administration, Special Supplement, October. Looks at tenure from point of view of agriculturalist.

Meek, C. K. 1952. "Some Social Aspects of Land Tenure in Africa." Journal of African Administration, Special Supplement, October. Good summary of lineages and land tenure; raises also question of village lands and rights, eg over undeveloped swamps.

Rowling, C. W. 1952. "An Analysis of Factors Effecting Changes in Land Tenure in Africa." Journal of African Administration, Special Supplement, October. Important discussion of African attitudes to improvements and implications for Crown leases and settlement schemes.

Tiffen, Mary. 1976. The Enterprising Peasant. London: HMSO. Illustrates changes in rights of sale recognised by local courts during a ten year period characterised by growing immigration and increased commercial crop sales, in Gombe, northern Nigeria.

West, H. W., and Grove, A. T. 1981. "Land Tenure, Policy and Management in English-Speaking African Countries: With Special Reference to Arid Land Problems." Unpublished report commissioned by the United Nations University, Tokyo. Good on concepts.

de Wilde, J. C. 1967. Experiences with Agricultural Development in Tropical Africa. Baltimore, USA: John Hopkins Press. Volume 1 includes Land Tenure chapter.