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BY: **D. MAGADLELA**

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Smallholder Irrigation Intervention as a Strategy for Rural Development: Some Sociological Observations[1]

Dumisani Magadlela[2]

Abstract

There are numerous, often diverse, mechanisms and strategies through which national government bodies, international and national development agencies, and local communities, attempt to transform, or improve, the welfare and well-being of the vast rural populations in Southern Africa. The various ways in which different rural communities have been disadvantaged either by ecological factors beyond anybody's control, by historical circumstances of one type or another, or by different political-economic factors, have led to the emergence over the years of a number of different rural development strategies to 'help the disadvantaged'. Some of these strategies have been aimed at either redressing the historical ills, at undoing structural restrictions on rural development efforts, or at opening up opportunities for equal or full participation of rural agricultural producers in national markets and economies. One of the noted strategies or processes for organizing rural development in some African countries has been the promotion of the development of small-scale irrigation schemes especially in regions prone to severe droughts and poor harvests. Rural development problems in general cannot be covered in one paper such as this. Suffice it to say that the majority (over 70 percent) of the people of Southern Africa live in rural areas and survive mainly from water and land resources that they have access to for the production of food (there is evidence, however, that cash remittances from urban wage-employed relatives in specific areas play important roles in some rural households). Successive droughts and persistent low production seasons in some regions have resulted in a surge not only in the promotion and popularity, but also in the construction rate of small dams and small-scale irrigation projects. The common objectives for this include the argument that they are attempts to provide people living in arid and remote areas with a chance to produce enough food for their households and boost rural economies. The question raised from this is: do small scale irrigation projects play an important role in the rural development process in rural communities where they are introduced?

Introduction

Some of the initial ideas from this paper sprang from an extended ethnographic study of one irrigation scheme in Eastern Zimbabwe's Manicaland Province, and partly from secondary data on the subject of smallholder irrigation in Zimbabwe and in the Southern African region in general. The thrust of the paper, however, is on ideas concerning the role of small scale irrigation farming in the rural development process. This part leans heavily on some (theoretical) sociological observations supporting such a development. The paper develops ideas that address what can be termed a 'sociology of smallholder irrigation development';

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[1] Most of the issues in this paper are derived from an extensive study of small scale irrigation and rural development in Zimbabwe, and these views are discussed in greater detail in a forthcoming thesis to be published with Wageningen Agricultural University.

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which entails carrying out detailed studies of how such small scale irrigation projects are formulated, constructed, managed and sustained over extended periods of time to try and transform the lives of rural people. The paper touches on arguments supporting the idea of promoting small scale irrigation development, and looks at ways in which such projects deal with their normally heavy-laden social, cultural and political-economic environments. Initially, there was an interest in the economic viability debate surrounding small scale irrigation, but this was limited to the direct counter arguments for political and social reform. The fact that most such projects are situated in generally poor ecological regions gives the economic viability argument more strength, and relegates the demand for them (irrigation projects) to politically expedient undertakings. The first part of the paper deals with a theoretical starting point in conceptualising rural development as an intervention process that pits local rural people with 'interested outsiders' such as government agencies or departments. This part also looks at the various definitions of rural development with the specific aim of contextualising small scale[3] irrigation farming in the wider rural development scenario. An additional idea is to explore arguments that support small scale irrigation's place or deny it a role in the rural development process, while at the same time 'teasing out' a relatively new theoretical starting point in dealing with rural development and development intervention issues.

The second part of the paper puts in context small scale irrigation development, both in its historical and contemporary environment of 'small-farming' in general. This is supported by placing the irrigation issues in the wider context of rural development, and the idea that irrigation development provides affordable solutions to some rural problems facing locals and their national governments. Then there is a section on small scale irrigation problems as rural development problems. This sections deals with a wide variety of issues surrounding the development of small scale irrigation schemes, including the controversial issue of farmer participation in the management of formal irrigation projects. The last section has a discussion and some conclusions from the analysis and calls for a multidisciplary approach to understanding small scale irrigation farming, its potentials and the problems surrounding it in the context of rural development.

Rural development: some conceptual dilemmas?

In a collection of cases from six Southern African countries' rural development situations, Fair (1992: 1) says that, "the rural areas are home to about 75 percent of the population of Sub-Saharan Africa". She notes that the World Bank (1989: 1) argues that, "overall, Africans are almost as poor today as they were 30 years ago". This argument is sustained by factors such as the high population growth rate, recurrent and severe droughts, changes from shifting cultivation to settled (including irrigation) farming, which lead to soil degradation and other environment-related problems, among others, which have all aggravated the rural development state of affairs in the region (Fair, 1992: 1). These ideas point towards a serious problem of rural marginalisation and an increasing lack of detailed data on situations faced by rural populations and how best to conceptualise them.

General views on rural development lead to a process whereby governments and other interested parties or development agencies try in various ways to assist rural people in their

[3] The use of 'small scale' and 'small holder' with reference to farmers in rural areas is the same throughout the paper: the two terms are used synonymously.

efforts to make their lives 'better'. Definitions of rural development have changed over the years with changes in approaches to the subject in practice, and I shall not attempt to give an overview of this in this paper. Only a few selected views of rural development are dealt with.

Some commentators in rural development say that rural development has been identified with economic growth, with modernisation, with increased agricultural production, with socialist forms of organisation, and with services for basic needs such as health, education, transport and water supply. Again, this view has changed over the years, especially with the realisation that so-called 'modernisation' or top-down approaches to development can lead to, and have resulted in, poor people being made poorer (Chambers, 1983: 146). Some attempts at defining rural development have been made, and some of them reflect the kind of thinking of the particular period. The World Bank Sector Paper on Rural Development, published in 1975, defined rural development as,

> "... a strategy designed to improve the economic and social life of a specific group of people - the rural poor. It involves extending the benefits of development to the poorest among those who seek a livelihood in the rural areas. The group includes small-scale farmers, tenants and the landless" (1975: 3, cited in Chambers, 1983: 147).

The problem with this definition is that old people, women and children, are not mentioned as specific groups that have been disadvantaged and that may need special attention for their special needs and circumstances. The tendency, which Chambers (1983) acknowledges, is that development policies are made by the powerful and well-off within their particular countries. Chambers (1983) calls for the reversal of that trend or initiative, which he hope will give local people a large share of the decision-making part of the rural development process, thereby allowing them full control of their livelihoods. His changed version of the definition of rural development, which I consider more grounded than the World Bank one, is that,

> "Rural development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children, more of what they want and need. It involves helping the poorest among those who seek a livelihood in rural areas to demand and control more of the benefits of development. The group includes small-scale farmers, tenants and the landless" (Chambers, 1983: 147).

My impression of rural development, however, is that it is more than a strategy to help rural people make their lives better in various ways. The idea of a 'strategy', although useful, already gives it the label of being an outsider-initiated and maybe jointly-implemented 'activity' or 'event'. One is persuaded to think that rural development is more of a 'process' than a 'strategy'. It might well be a 'strategic process' involving efforts by local rural people to mobilise different resources at their disposal, with the primary objective being to change or improve their lives. My view of it is also that it is a negotiation process and a struggle among locals and between locals and different kinds of (often well-meaning, often mis-informed) intervenors about what needs to happen in order to better the lives of rural people from their own standpoint of what is 'better'. Chambers maintains that the initiative for development *can* start with outsiders and adds that the objective, however, should be to empower the poor and

give them control over what happens around them (Chambers, 1983: 147). There is need to realise that locals have their own form of power and control, and may not be *given* power and control by outsiders as envisaged by many outsiders. The idea would be to work from inside the community, acknowledging their local power relationships, their socio-political networks and structures, and their local knowledge systems in the context of their development objectives.

In the analysis of relations among social actors in rural development contexts, an actor-oriented approach is an appropriate theoretical starting point for a fuller understanding of what takes place in such situations. The actor-oriented perspective places social actors at the centre of the development stage and recognises the 'multiple realities' of their interface relations. At the same time it calls for effective locally based ways of understanding the life-worlds of the different actors (Long, 1992: 5). As such, an actor-oriented approach treats all social actors as "active participants who process information and strategize in their dealings with some local actors as well as interveners" (*ibid*: 21). In his inaugural lecture *'Creating Space for Change'*, Long (1984), discusses alternative ways of dealing with external interventions in rural development situations. One of the salient arguments he raises is that external intervention, such as small scale irrigation projects, is "mediated and transformed by internal structures" (p.2). In another source, Long (1992: 18-19) criticises Modernisation theory which sees development "in terms of a progressive movement towards technologically and institutionally more complex and integrated forms of modern society, which involves the integration of the modernising society into commodity markets". One of the persuasive criticisms levelled against this approach is that local people almost always have their own perceptions of (rural) development, hence development interventions with external sources turn out to have unexpected (negotiated) outcomes (Long, 1989, 1992; Arce and Long, 1992; Arce, 1989).

It is easy to believe that rural people, or rural producers, are capable of making a difference in their own lives, but also that they need some form of assistance to achieve some of their goals. One is bound to be convinced that the odds against them in efforts to improve their conditions are often beyond them (examples here are road construction, health facilities, etc). The exploitative nature of market relations in the neo-Marxist tradition, and the trickle-down approach of development benefits in the Modernisation approach, give one the impression that rural populations in developing societies have to wait for development to come from somewhere else, while in the meantime trying to stay clear of greedy exploitative relations among themselves and trying to secure their livelihoods which increasingly get tangled up with national and international economic relations through processes of globalisation.

It has been noted that the main weakness of Modernisation and neo-Marxism as theories of development is that they both see "development and social change as emanating primarily from centres of power in the form of intervention by state or international interests..." (Long, 1992: 19). To snap out of this entrapping view Long and van der Ploeg propose an actor-oriented approach that views intervention as a 'multiple reality' made up of differing cultural perceptions and social interests, and constituted by the on-going social and political struggles that take place between the social actors involved (1989: 226). They also argue that "one has to focus not on the models of intervention as such, but more attention should be paid to intervention practices". This, they contend, allows one to take into account the "emergent forms of interaction, procedures, practical strategies, types of discourse, cultural categories and the various 'stakeholders' present in specific [rural development] contexts" (Long and van

der Ploeg, 1989: 226-7).

There has been acknowledgement of the fact that theoretical paradigms of planned intervention of the 1960's and 1970's had linear, step-by-step or mechanical views of development intervention, and saw the process as consisting of policy planning, implementation, and outcomes. Long and van der Ploeg argue, instead, that local groups actively formulate and pursue their own 'development projects' that often clash with the interests of central authority (1989: 267). They go on to add that from around the 1980's "there was a growing recognition of such deficiencies among policy analysts, with new views which saw intervention as a transactional process involving negotiation over goals and means between parties with conflicting or diverging interests, and not simply as the execution of a particular policy" (Warwick, 1982, cited in Long and van der Ploeg, 1989: 227).

In a related argument, Arce contends that "the acceptance of change does not depend upon a force emanating from centres of power (state, powerful economic and political groups, donor agencies, other international institutions), but upon its resonance within established local practices and the interpretation of external influences by different actors within the local community" (1993: 6). The nature and character of rural development intervention is thus seen as an outcome of interaction between different actors involved in the process at its different stages. Van der Zaag says that "since intervention, much like research activity, involves a learning process, it can never ... be completely planned for from the outset" (1992: 213). A study of a community development programme in Benin by Mongbo (1995) shows how what he calls the 'field of rural development' comprises people who see it differently and get what they want from it using different ways.

In the form of small scale irrigation development, intervention presents to farmers a new set of values which they may or may not internalise, or adopt and adapt to their situations automatically. They may not have had previous or related experience or a history of contact with such an innovation. Their relation to it, and the meanings that they are expected to attach to it, or to parts of it, and how they develop or attach their own meanings to it, demand that one uses an analytical framework that gets closest to doing justice to the complexity of such intervention situations. The actor-oriented perspective and its related research methods help one to interpret different responses at all levels, and better still, with a hands-on addition to it. As Long puts it,

> "An actor-oriented approach requires a full analysis of the ways in which different social actors manage and interpret new elements in their life-worlds" (Long, 1989: 9).

This, I am convinced, is one way of looking at rural development which is slightly different, if not unconventional, from what most development practitioners advocate or have been trained to believe is the way to go about it. The idea that no one party or group of actors plays a more important role than the other in itself acknowledges the multifaceted nature of the field of rural development. This approach helps the researcher and the practitioner to become aware of, on the one hand, attempts by interveners to 'organise local dis-organisation', to 'improve' so-called 'backward' rural lives and, on the other hand, local strategies of creating their space for manoeuvre. Rural producers may not intend their actions to be direct attempts to avoid external manipulation or influence as such, but they regard them as part of their own logical responses to daily needs in struggles for survival within the framework of their cultural and institutional

constraints. As individuals, and through their groups, networks, coalitions and cliques, farmers in rural areas interact with many different 'change agents'.

The (rural development) context of small scale irrigation farming

Mushala's case study from Swaziland offers a fresh view of the role of small scale irrigation development in rural development. He points out that small scale farming has been "prioritised in the Swazi national government's development strategy ... for achieving national self-sufficiency in the production of certain crops, and also as a means of encouraging cash crop production among small scale farmers" (Mushala, 1995: 121). There is widespread support for the argument raised by Mushala that the ultimate aim of developing small scale irrigation is for rural people to be well fed, to have higher incomes from better use of available resources and an improved way of life as a result of increased productivity. In this way, he adds, "smallholder irrigation is one way of enhancing rural development ..." (1995: 121). He argues that rural development involves community participation in efforts that aim to improve or transform their lives, economically and socio-culturally. Based on evidence from such studies, governments in the region generally view their development efforts, one tends to agree with Mushala's (1995) view that the transformation of people's conditions is generally supplemented by an injection of technical and other services.

Mushala (1995) stresses the fact that if small scale irrigation farming is seen in the realm of rural development (which I believe it must be), it becomes easier to review the extent to which it has enhanced community participation and the extent to which technical and other services provided by government have precipitated rural development. He advances the view that small scale irrigation farming is capable of enhancing rural development in line with some of the objectives of development in general (1995: 122). Mushala concludes with the argument that lack of people's participation in their own projects culminates in situations whereby their spirit to participate in the management of the project is undermined (1995: 141). The importance of Mushala's (1995) case analysis and other similar studies is that they place small scale irrigation farming in its proper context of the whole rural development process, especially seeing it as away of mobilising different resources for production, management and organisation among rural people.

Rukuni, who has contributed significantly to research and debate on smallholder irrigation development in Zimbabwe, argues that,

> "After switching from rainfed to irrigated farming, it takes a long time, maybe a whole generation, for farmers to adjust to new work routines, increased risk and technical requirements. Unfortunately, little is being done to speed up this adjustment. For instance, *almost no research is being carried out on the sociological and managerial issues facing smallholder irrigation associations* (1995: 93, my emphasis).

It is important to note that there are limited detailed studies in the Southern African region that pay particular attention to sociological factors surrounding small scale irrigation farming or development in rural areas. This is an area that needs special focus especially in the wake of the region's severe recurrent dry spells. The role of small scale irrigation farming in boosting household food production has never been more crucial. One recent study that looks at the

practices of small scale irrigation farmers in their 'backyards' as it were, is a compilation of case studies in a book edited by Manzungu and van der Zaag (1996) based on studies from Zimbabwe's eastern Manicaland Province.

In a critical discussion of the role of small scale irrigation in rural development in Sub-Saharan Africa, Underhill (1990), starts by pointing out that irrigation farming in Africa in general dates back to pre-historic times, and adds that it is the same story for small scale irrigation farming. In the context of the underdeveloped or developing countries, however, there is something new about the idea of small scale irrigation, there is something about rediscovering the whole concept and experience of irrigation farming. Underhill (1990) believes that the a major advantage of irrigation farming, its potential ability to control the main and critical resource in farm production, that is, the control and regulation of water supply, has captured the imagination of many development agencies in developing countries. He says that large scale irrigation seemed easier to develop, with clear-cut plans of action normally reaching targeted outputs, but small scale irrigation has been at the other extreme where there is less information on the dynamics of its development in specific situations. As a potential solution to farming or production-related problems for large numbers of small rural farmers in poor farming conditions, small scale irrigation has occupied a priority role in some national government development plans (Underhill, 1990: v).

An 1987 FAO paper defined irrigation as "the application of water supplementary to that supplied directly by precipitation for the production of crops" (in Underhill, 1990: 2). There are different types of irrigation systems, but among small scale irrigators there are mainly two common types, which are the *formal* and informal irrigation systems. The former is developed and managed by government agencies, normally with heavy subsidies *as part of the rural development process*[4], and the latter is developed and run by groups of farmers on their own with minimum, if any, external intervention or involvement, as a direct response to locally identified farming and/or food needs. Underhill (1990) argues that small scale usually refers to informal, and large scale is generally used to refer to formal, irrigation projects. Classification of irrigation schemes in Africa (FAO, 1987) points to the fact that small scale means those schemes that are between 1 and 100 ha in size, and large scale means those schemes that are over 10 000 ha (Underhill, 1990: 3). The smaller schemes are the ones normally related to rural development programmes in developing countries.

But why, if irrigation farming carries with it such an advantage, do small scale farmers who have access to irrigated land tend to keep their access to rainfed agriculture too? Reasons and answers given by Rukuni (1988) include the fact that irrigation plots are too small; that there is inadequate security of tenure on irrigation schemes; that production on most of these schemes is low as a direct result of water shortages; and that small scale farmers tend to resist the idea that they have to be restricted to particular crops selected by irrigation specialists and prescribed to them in cropping programmes which are often enforced by irrigation officials. Farmers in such places do not have their own choices of what to grow and when.

The demographic composition of rural populations in some cases presents problems for irrigation planners. For example, there are some areas earmarked for irrigation which have

[4] The emphasis on formal small scale irrigation as part of the rural development effort is meant to highlight the fact that informal irrigation practices, such as those of community constructed and community run schemes, are not taken seriously or acknowledged as playing any significant part in the rural development process, when in fact they do.

widows, old people and young couples as the majority of prospective plotholders. The labour problem in some situations and during some seasons is so serious that there is need for in-depth studies of how this can be dealt with. Labour problems limit the amount of land cultivated in both rainfed agriculture and in irrigation schemes and this has implications for rural development programmes that emphasise farming.

The purpose of construction of some of these irrigation schemes says a lot about their future performances. In some cases they are meant to improve the standard of living of rural populations hard hit by droughts; in other cases they are meant to resettle displaced rural populations or to relieve land pressure in other parts of a region, or to give a new, better source of livelihood to victims of droughts or famines (Underhill, 1990: 14; Rukuni, 1984; Pazvakavambwa, 1984: 421). The following data gives part of the picture in the field os small holder irrigation farming in nine African countries.

Table 1: *Estimates of irrigated areas in selected Sub-Saharan African countries*[5]

Country	Irr.potential ('000 ha)	Developed/ modern	small-scale/ traditional	Total Developed	Dev. % of total
Botswana	100	0	12	12	12
Angola	6,700	0	10	10	-
Ghana	120	5	5	10	8
Lesotho	8	0	1	1	13
Nigeria	2,000	50	800	850	43
Swaziland	7	55	5	60	100
Sudan	3,300	1,700	50	1,750	53
Tanzania	2,300	25	115	140	6
Zimbabwe	280	127	3	130	46

Source: Adapted from FAO (1986), cited in Underhill (1990: 20).

Underhill (1990) also stresses the fact that irrigation should be seen in the context of the wider framework of integrated rural development as but one aspect of a broader problem, not as a separate measure of trying to solve rural development problems as such. He says that large scale irrigation in Africa has only been introduced in this century, but small scale irrigation in its various forms has been practised from time immemorial (Underhill, 1990: 13). For him, rural development problems in Sub-Saharan Africa have a peculiar link to land and water

[5] This table shows figures from randomly selected countries. The figures are from 1982, and do not reflect the current status of irrigation development in the respective countries. There is more land now under irrigation farming in Sub-Saharan Africa.

access issues and problems, and this brings forth the debate about whether small scale farmers should shift to irrigation farming, stick to rain-fed agriculture, or have access to both, something which most of them seem to prefer (also in Rukuni, 1984, 1988).

Underhill (1984: 14) points out that *formal* small scale irrigation in Africa dates back to the colonial period (with the exception of Madagascar and Egypt), when irrigation schemes were constructed to produce cash crops (to service growing new urban and industrialising centres), and were run by government departments or other external agencies. According to Underhill (1990) advantages of small scale irrigation farming include, among others, that: they help initiate a development process, and not plan a development action (and can be seen as part of that process themselves); they help farmers become self-reliant and not dependent on external support, and farmers dictate the pace of development; they mobilise labour and human resources in general, and assist farmers to learn by doing things for themselves; they reach rural people where they are and slow down the urban drift from rural areas by making rural areas slightly more attractive than they normally would be; they require low external inputs, and local people can help with management if they identify with the project. Many experts on irrigation have admitted that the high input/high output type of irrigation development is not suitable for the African set-up (Underhill, 1990: 18).

Small scale irrigation problems as rural development problems

Small holder farmers in different parts of the Sub-Saharan region obviously face different problems, but there are cases where their stories and problems tend to converge. One of these areas concerns the constraints which they face regarding production of their crops, the purchasing of inputs, marketing structures, labour problems, a 'feminised' rural agricultural labour force as a result of male migration into urban wage employment. The demographic composition of some rural African communities calls for more attention. On the same demographic question in rural development, Underhill (1990)says that compared to South-East Asia, for example, African rural areas are less densely populated and have less cohesive rural communities, which means that they are more at home with rain-fed farming that is less community participatory, than irrigation farming that calls for farmer co-operation and activity co-ordination. Farmers calculate the risks involved in their farming ventures, and take the less risky path (p. 19). Underhill further argues that irrigation projects will fail if their development is a combination on the one hand, of high investment, remotely controlled, projects, with expensive input requirements, and on the other, an alienated and uncommitted peasantry (1990: 19).

Quite in line with participatory and actor-oriented approaches to rural development, Underhill (1990: 19), concedes that bottom-up irrigation schemes can be economically efficient, and projects designed around people can achieve very satisfactory production targets as well as human betterment, while projects designed around production often fall short on both counts.

On the controversial issue of the performance of most small scale irrigation schemes, Carruthers and Upton (1982) argue that "...the performance data suggest that the temptation to see irrigation as the general solution to arid land and unreliable climate should be resisted" (cited in Underhill, 1990: 20). The common view related to this point is that the data on which this view is based are not and should not be the standard measure of whether such projects are viable on not. Some of them achieve way more than the set criteria for measuring their

viability are able to analyze.

Most of the problems facing small scale irrigation farming revolve around several issues including: inadequate project preparation (often taking long and becoming costly); failure by management to supply enough inputs on time (including water); poor communication between designers/engineers and irrigation users (farmers); ill-timed or non-existent farmer participation at different stages of project development; inattention to Operation and Maintenance (O&M) issues after project completion; disjointed co-ordination of on-farm water distribution and management; macro-economic policy environment, such as general national economic factors, including pricing policies, market structures, under constantly changing government and international policies.

Rukuni (1984a) argues that most small scale irrigation schemes are generally characterised by low production levels, which reduces the economic attractiveness of otherwise desired irrigation development (p. 385). The crucial role of small scale irrigation projects in countries like Sudan, Zambia, Malawi, Tanzania and Zimbabwe, for example, has been the provision of food in normally food deficit areas, especially the production of the staple food crop of maize (in most of them). Rukuni (1984a) stresses that the size of the irrigated plot has a significant impact on the productivity and attractiveness of irrigation farming. The tendency, from Rukuni's examples, is that the smaller the plot, the more likely that the farmers will grow food or subsistence crops (Rukuni, 1984a: 387).

In a related argument, Rukuni (1984b), says that irrigation development places those farmers who have access to it at a better position than those in dryland to produce enough food for their families and be able to sell surpluses for the much needed cash. They are seen as better (sometimes "privileged") than farmers dependent on rain-fed farming alone (Rukuni, 1984b: 401). For Rukuni,

> "Irrigation is a major departure from rain-fed agriculture for small farmers. It means harder work throughout the year in cases, and more pressure to use purchased inputs and improved cropping systems so as to achieve higher yields. The less experience the farmer has with irrigation, the more it is a risky occupation. On most small holder schemes in Africa, these risks are compounded by the poor technical design and efficiency of schemes. As sources of risk accumulate, or appear so to the farmer, the more the farmer has to fall back on more familiar rain-fed agriculture" (Rukuni, 1984b: 402).

This is a critical aspect that may help governments and development agencies come to grips with some of the unravelled operational and performance problems within the small holder irrigation sub-sector. The fact that small scale farmers either in irrigation schemes or in rain-fed farming prefer to limit or spread their farming risks is nothing new. It has characterised this agricultural sector for a long time. The spreading of risks should not be expected to fall just because farmers have been afforded easy access to land and water. They tend to be uncertain of what is going to happen next, especially with the fact that they do not have secure tenure in most of these small scale irrigation projects. Rukuni further points out that,

> "... one of the most important variables that is difficult to estimate at the planning stage is the rate of uptake [or adoption] of new or improved technology by the farmers. Yet this variable is critical to both financial and

economic viability of the schemes" (1984b: 402).

This issue is closely related to the one of risk avoidance just mentioned above. The rate of adoption of the new farming technology is based on the farmer's perceived benefits from the particular innovation, and nay forms of persuasion thrust upon the farmer have to take into account the history of farming in the particular areas and the other factors in the farmer's ecological, social, cultural, economic and political environments. Problems with adoption also tend to stem from inadequate consultations between intended beneficiaries (farmers) and technical developers of irrigation. More detailed and patient discussions of the full implications (including projected outcomes), is bound to achieve wider acceptance (or at least more tolerance) of the project. In a study of Nyamaropa irrigation scheme, Reynolds (1969), Magadlela and Hebinck (1995)and Magadlela (1995; 1997-*forthcoming*;), show how local villagers rejected irrigation intervention in their area resulting in intervenors inviting people from afar to come and make use of the irrigation scheme. The main reason for rejecting it were, among others, that there was not enough in-depth discussions with villagers on the full meaning of irrigation farming. After more than thirty years, local villagers were found to be calling for full participation in irrigation farming, mainly because they had seen how it had helped those who adopted it.

On some of the problems facing small scale farming, Rukuni (1988) points out that irrigated plots have for long been said by farmers to be too small; they also argue that there is insecure tenure in the irrigation schemes, with the possibility of being evicted from the project always present. There are also complaints about low production as a result of water shortages and restrictions on crops grown (1988: 3). Government has always subsidized the costs of construction, operation and maintenance of all [formal] small holder schemes, mainly those constructed and managed by government departments. Up to July 1984, irrigators were required to pay rates ranging from Z$6 to Z$70 per ha per year (depending on the type of scheme, whether it uses a pumping or gravity system). These charges accounted for only 11 percent of the annual running costs for these projects (less staff salaries) (p. 15), which meant that there were heavy government subsidies.

Currently, small holder irrigators in most irrigation schemes in Zimbabwe pay about Z$145 per ha per year, and this is not enough to cover the costs of operation and maintenance, which have come up to about Z$246 per ha per year, excluding staff salaries. This means that only about 25 percent of the costs are recovered from the fees farmers pay (Rukuni, 1988: 17). This minimum charge was justified only by the fact that the schemes were set up as projects for famine relief, not economic enterprises. The idea being spread around that farmers should take over the full management and responsibility for running the schemes raises tough questions over who will foot the huge Operation and Maintenance bills especially in those schemes that are expensive to operate, mainly those with electricity pumping equipment and sprinkler systems.

From a different ('economic efficiency' angle), Peacock (1994), says that there is a myth held by some government officials in Zimbabwe's agriculture sector that small holder irrigation development is economically viable and can contribute to economic development. He says that it is improper to think that irrigation schemes that appear economically unviable can still be justified on grounds of "social desirability", including household and local food security (Peacock, 1994: 1). Average development costs for smallholder irrigation schemes is about Z$170 000 per ha including dam construction (*ibid:* 11). For Peacock (1994), the

Operation and Maintenance costs from a typical small holder scheme are of the order of Z$3 100 per ha per year. Farmers pay Z$145 per ha per year, and the rest is picked up by the government. The Zimbabwe government, according to Peacock, pays about Z$21 million per year in subsidies towards small holder irrigation schemes (1994: 12), which is a huge subsidy bill considering the financial returns from the same subsidised source. The main justification often raised to counter such 'economic-efficiency' arguments is that small scale irrigation farming and other forms of small scale farming in general have been historically disadvantaged, and thus need all the financial and other support services that they can get. There is more of socio-political justification than economic rationality in making such decisions, and politicians tend to argue that while government needs financial assistance itself, they cannot let economic principles overturn their political victories by upsetting their political constituents.

Ng'ong'ola (1995: 38), through his study from Malawi, says that case studies show that self-help schemes help farmers develop skills to solve their own problems without waiting for external assistance, say, from government officials. In a similar case, Kagubila (1995: 89) details a Tanzanian case whereby farmer participation and level of involvement in irrigation ventures is based on their perceived direct and indirect benefits accruing from that involvement. Kagubila argues that improvement in production under farmer-managed schemes is a measure of how rural people can achieve significant levels of development on their own. He believes that irrigation stands a good chance of alleviating rural poverty in Tanzania (Kagubila, 1995: 90). A similar case from Zambia is narrated by Akayombokwa (1995), who says that there are high prospects for establishing small holder irrigation schemes in the Southern African region as a whole to counter the negative effects of droughts and to alleviate poverty. He calls for more governments' commitment to such developments, and adds that there seems to be a growing demand for irrigation schemes in the wake of recurrent droughts in the sub-region. He then calls for the involvement of potential beneficiaries in the initial stages of developing such projects as a way of fostering a sense of ownership of the project, something that is increasingly being regarded by many researchers and development practitioners as essential for project sustainability (Akayambokwa, 1995: 126).

On the same contentious issue of farmer participation in irrigation management, Makadho (1995) discusses the Zimbabwean side of the story. He argues that the objectives of small holder irrigation development can be looked at from the point of view of the interests and relative priorities of various actors (stakeholders) involved in the process. These include politicians, government agencies (as system operators in many cases), Non-Governmental Organisations (NGOs), and farmers themselves as the "main actors" in the development game. National goals of irrigation development in Zimbabwe, especially as put across in the First and Second National Development Plans, include: land reform and efficient utilization of arable land; raising the standards of living of the entire population, especially of the rural people; creation of employment and making food easily available in sufficient quantities in dry areas (Makadho, 1995: 129). Some of these objectives are discussed by Meizen-Dick (1993), and in a department of Rural Development (1983) policy paper.

On the issue of small holder irrigation objectives Makadho (1995) further argues that irrigation farming is regarded as a means of saving the high costs of public food distribution in drought-prone areas when crops fail under dryland cultivation. He says that it is seen as cheaper to help people produce their own food than to transport and distribute food to them. He also adds that there is a political imperative behind constructing such projects; that they

create political stability in that a food self-secure population is not likely to rise against its political leadership (Makadho, 1995: 130).

In the Zimbabwean case, farmers in communal (rural) areas do not have title to land, that is, they do not own the land. Instead, they have three basic permits: a permit to reside, a permit to cultivate, and a permit to depasture stock under the Rural Land Act. Through this same Act, the Minister of Lands has the power to evict tenants in government run small holder irrigation schemes (p. 133). Makadho (1995) mentions several examples of cases where such projects failed because managers and technical personnel did not take seriously the socio-cultural factors involved at different stages of implementing such projects. These examples include a Nigerian case study by Palmer-Jones (1980, 1981), and a Malawian case described by Mpande (1984), whereby the technical 'experts' ignored calls for more involvement of the local people at the initial stage, with serious management consequences later. There is about the same story on the Zimbabwean case given by Mupawose (1984), Rukuni (1984, 1988) and Pazvakavambwa (1984) where projects do not achieve projected objectives because of what can be termed technical experts' ineptitude and their reluctance to acknowledge the role of sociological or social factors such as rural people's own knowledge systems, tried and tested (traditional?) farming practices and priorities in the specific cultural environments. Makadho's (1995) conclusion is that managers and technicians' approaches to irrigation result in situations whereby farmers have very little say in the running of what are considered 'their' development projects, and instead become passive actors in the whole process (p. 139), something which affects long-term viability and sustainability of such development projects.

An interesting issue raised by Makadho (19950 is that generally small holder irrigation farming does benefit farmers involved in it better than does dryland cultivation for those practising it full-time. He adds that such projects should be encouraged *'at all costs'* because they help in food production and security, and in risk avoidance. He also notes that community run irrigation schemes are more successful than those operated and managed by government personnel (Makadho, 1995: 155).

Discussion and conclusions

There are various ways in which one can attempt to unravel some of the major problems in rural development in Southern Africa in general. From the ensuring ideas from the several authors cited, it is clear that small scale irrigation farming has a role to play in the gradual process of rural development in different contexts. There are conceptual problems surrounding the field of rural development, and this paper attempts to chart a course that recognises the 'knowledgeability and capability' of marginalised rural people to shape their own lives and influence what happens with their livelihoods. There are crucial sections of rural development that this paper does not dwell upon but which are acknowledged as crucial, and one of them is the gender question in small scale irrigation and in rural development in general. Women have been seen to take the worst effects of rural development programmes in some cases, for example, Web (1991)'s paper on the Gambia shows how a small scale irrigation project initially benefited rural households, and then goes on to show that later when it collapsed due to institutional and organisational-managerial problems women borer the full brunt of the failure.

To round up the argument for a more intense sociological role in small scale irrigation development in the practice of rural development, Diemer and Speelman (1990) contend that

'irrigation agriculture is a social process'. Their work, as they put it, is based on the assumption that,

> "[irrigation] designs should be adapted to local relationships because the irrigation crisis in Africa has shown that physical infrastructures cannot change behaviour patterns [but people change and adapt designs to their own practised ways of doing things]" (Diemer and Speelman, 1990: 1).

In other words, irrigation hardware has to be adaptable to the local software, which includes local knowledge and local customs regarding farming practices and farmers' behaviour in relating to land and water. A similar argument is discussed in detail by Ubels (1989) who treats irrigation systems as social interfaces, and recommends that we regard irrigation systems as systems or products of social interaction.

Still in line with the above argument, Magadlela and Hebinck (1995)'s study of a 30 year old small scale irrigation project looks at the expected and unexpected outcomes of a small holder irrigation development project. Some of the expected outcomes were improved standards of living, higher incomes from farming and increased production of cash crops: these were generally (variously) achieved. The problem with the project was how to deal with the range of unexpected outcomes such as ethnic rivalry over access to land by different groups who claimed to have more legitimate claims to irrigated land than others. They detailed cases of struggles between local villagers who were living at the particular place before the construction of the project (but rejected the irrigation scheme as a way of farming), and immigrants who came into the area from afar specifically to join the irrigation project for its potential benefits. They argue that it is crucial for rural development practitioners to take into account the full range of possibilities of local people's responses to external intervention, and that outsiders need open minds about how to approach local-level resistance to rural project development.

On the whole, there seems to be open gaps in the conceptual framework for rural development especially when it comes to relating small scale irrigation farming to the whole process of rural development in general. The role of small scale irrigation farming in helping small farmers in rural areas cope with food shortages and gain a semblance of control over water through irrigation facilities offers them an advantage in production and reduces risks normally involved with rain-fed cultivation. There are limited examples, however, that show widespread adoption of irrigation farming as away of life by rural populations, a factor indicating that there is need to investigate the reasons why some 'small' farmers still prefer to stick to their rain-fed farming in spite of the 'obvious' advantages of irrigation farming in specific situations.

To reiterate the conceptual argument, it is highlighted here that rural development projects should be regarded and treated as arenas of struggle between different actors or stakeholders who have different interests in the project, and the state of a rural development (or irrigation) project after years of operation is a reflection of these local-level negotiations and struggles over what has to take place and what the state of affairs should be. That small scale irrigation farming has the potential to play an important role in rural development efforts is undeniable, how this is achievable remains a major questions for government departments, development practitioners and academics alike.

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