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Informal Irrigation in Lake Chilwa Basin

Stream-bank and Wetland Gardens

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Informal Irrigation in Lake Chilwa Basin: Stream-bank and Wetland Gardens

Pauline E. Peters

I Research Design

Within the overall aim of BASIS research as options for broadening access to key factors of water and land, the research questions posed about informal irrigation included the following: (i) Given that the economic importance of informal or farmer-initiated irrigation along stream-banks and in wetlands has been neglected until the recent drought years, what are the patterns of access, types of claims and rights, and categories of uses and users over these valuable resources? (ii) In particular, in light of new policies on land, water and irrigation, what can be learned about the forms of tenure and/or open access, and what policy implications can be identified?

This report is based on research conducted by the BASIS team but also on preliminary analysis of doctoral research on wetlands, which was partially funded through BASIS. The methods used for the study of stream-bank gardens included a census of gardens (*dimba*) along the Likangala river, a baseline survey of a sample of the censused gardens and their owners/users, and qualitative research conducted by a field assistant resident in the study site. In addition, the baseline surveys and qualitative research by the two research assistants working on the formal irrigation sites (see separate report by Mulwafu and Ferguson) also provided information on stream-bank gardens. As noted, most of the information provided here on gardens in the wetlands comes from the preliminary analysis by Kambewa, a doctoral student at the University of Malawi (and see his more detailed report) though some also is derived from the work of the field assistants mentioned. This is for the obvious reason that the study sites are all in the Chilwa Basin.

II Introduction and Policy Context

In a land-scarce country with a single annual rainfall such as Malawi, areas with access to relatively secure water year-round have the highest value. This is the single most important point about stream-bank gardens and wetlands, which helps explain the current and mounting competition over their control, the new attention being paid to them by policy-makers and donors, and the critical need to ensure they are adequately addressed in current policy changes.

Across tropical Africa, wetlands, comprising coastal wetlands, lake margins, river floodplains, and small inland valleys, have long been a highly valued resource. Wetlands have been estimated to constitute around 200 million hectares across Sub-Saharan Africa, about 3 million hectares of which are cultivated with rice as a major crop.¹ In inland countries of Southern Africa, the major forms of wetland are river floodplains, lake margins, and wetlands. The latter are called *dambo* in much of the region, also *vleis* and

*Broadening Access and Strengthening Input Market Systems – Collaborative Research Support Program, funded by USAID/Washington.

¹ Mharapara 1995: 1.

mapani in Zimbabwe. Written accounts on the use of wetlands for cultivation in this region date from at least the 19th century, although it was probably present earlier. One account from what was then Southern Rhodesia in 1909 reported that rice had been a staple for Shona people for a century, and had been grown in “swampy areas” (*dambo*) in the eastern part of the country. The reporter described seeing many such fields then in the process of being abandoned as people switched to growing the recently introduced maize in the upland (drier) fields.² Historians of Malawi describe the Chilwa Basin as one of the centres of settlement and political rivalry among groups such as the Nyanja, Yao, Ngoni and Lomwe. Oral traditions refer to the use of the watered areas for agriculture including the use of the flood plains and stream-banks for cultivation of crops. In the late 1890s, the British Central African administration declared Lake Chilwa as a game reserve, where hunting with licences was allowed for the twenty-eight species listed, including elephant, black rhinoceros, and blue wildebeest. In 1911 the area was descheduled as a reserve.³ In addition, European estates were being established along the rivers of the Basin.⁴

Throughout the 20th century and continuing to the present, these wetlands have come under increasing use for cultivation of various types, livestock grazing, fishing, hunting birds and small animals, and multiple other uses. The colonial administrations in Nyasaland (Malawi) and Southern Rhodesia tried to forbid the use of wetlands, both *dambo* (as defined above), and stream-banks, often with little success. Today, the rule remains ‘on the books’ in Malawi but seems to be rarely, if ever, enforced. Moreover, the colonial administration in Nyasaland selected known wetlands for the irrigation schemes they established from around 1950 and beyond, apparently influenced by observation of local patterns of use in the Basin.⁵ The post-independence government, under Dr Banda, followed this pattern, establishing other small-scale irrigation schemes, including those studied in the BASIS research. At the same time, the continuing and intensifying uses of wetlands and stream-banks were largely ignored in official statistics in both Malawi and Zimbabwe. This has begun to change in recent decades.

Scientists, social scientists, and development policy analysts in Malawi and Zimbabwe have begun to document the extensive use of wetlands for low-capital intensive but high labour-intensive irrigation, to demonstrate the scientific errors in the earlier assumption that all cultivation in wetlands, by definition, has negative effects, and to suggest low-risk means of increasing cultivation in one of the most valuable of resources in the region.⁶ An FAO report summarized some of this work, saying, “research in Malawi and Zimbabwe has shown that the main cause of dambo gullyng is not cultivation or irrigation within the dambo but increased cultivation in the dambo interfluves and also over-usage by livestock...”, and quotes one study as suggesting that cultivation in the dambo should even be encouraged in order to reduce pressure on the interfluves, at least up to “30% of the dambo area or 10% of the catchment, whichever is less” (1996:79). The same report, again relying on other research, is not as sanguine about streambank cultivation, specifically saying it would not be promoted in any new

² Sawer, cited in Mharapara.

³ GOM 2001.

⁴ Phiri 1984, Phiri 1987, Vaughan 1978.

⁵ Nkhoma 2004

⁶ Owen et al., 1995.

programme, but that the latter should “seek to assist communities in the protection and conservation of any land [along the streambanks] ... at risk from erosion” (p.79).

In Malawi, these specific suggestions have not (yet) been picked up by the authorities, though the turn to environmentally conscious policies since the early 1990s has brought wetlands more to the fore in policy circles than before. Similarly, the more recent decision by government and donors that irrigation is central to achieving a more food secure population has also turned attention to stream-bank gardens and wetland cultivation. Existing estimates of the scale of informal irrigation in relation to formal irrigation differ but all seem to agree that both have increased twofold over the past decade. A feasibility study on irrigation by the Malawi Government referred to 27,000 ha in formal irrigation “today”, and cited a figure from a 1991 FAO report of 123,000 ha for informal irrigation (GOM 2000b). While other figures for formal irrigation differ little, those for informal irrigation do so quite considerably. Estimates given in a 1995 FAO report were 76,410 hectares of irrigated land in Malawi, of which 65.4% (50,000 ha) was informal or *dimba* cultivation, the rest under formal irrigation. A recent World Bank estimate is 28,000 hectares under “formal or semi-formal” irrigation, of which 6500 ha is under self-help smallholder schemes, 3200 ha under irrigation schemes, and 18,300 ha in estates. The figure of 62,000 ha is given for informal irrigation. An estimate for informal irrigation given in a recent Wetland SADC workshop on wetlands is “more than 118,000 ha of wetlands irrigated by traditional methods” (FAO 2001:121). The common estimate for the potential irrigated area (not limited to wetlands) is between a quarter and a half million hectares. Despite the new policy emphasis on the potential in wetlands and stream-banks for intensifying production, and despite the presence of some studies documenting their use and value,⁷ there are considerable gaps in knowledge about their existing uses and the modes of access and control over them, as well as gaps and disjunctions in the policies affecting them.

Previous research in the Chilwa Basin documenting land use change has shown a net increase in cultivation, including a conversion of wetlands to rice production, and in settlement. Despite tree-planting associated with settlement, there was a net loss in woods and wetlands.⁸ Like all other wetland areas of the country, livestock numbers have been decreasing.⁹ BASIS research over the past three years in the Chilwa Basin, especially along the Likangala, Naisi, and Domasi rivers, has revealed intensification in use of stream-bank and wetland areas and a related increase in competition, and some conflict, over their control and use. Two dimensions of this situation are the rising value in the use of watered areas, and increasing numbers of people seeking to gain access to them, an increase due not only to population growth typical of the country but also to in-migration.

The main reasons for the recognition of increased value in the watered areas are the following. First, while watered land has long been recognized as an important strategy to improve family food security and income, it has gained even more value in people’s eyes in the wake of the droughts and floods in the past two decades. Secondly, the irrigation schemes established in the 1970s significantly boosted rice production, revealing the attractions of the crop as food and cash crop. Thirdly, there has been an increasing response to the demand for foodstuffs by urban and peri-urban consumers as

⁷ Ngwira 1994, Wiyo et al 1994, Mloza Banda et al 2003.

⁸ Jamu et al nd.

⁹ FAO 1996.

well as by buyers in local markets that is concomitant with an increasing diversification in family income strategies. Fourthly, several significant changes in policy direction have intensified interest in and concern over the valuable watered lands. These include, in particular, the growing conviction among government, donors, and NGOs about the appropriateness of small-scale irrigation as a direction for development, and the recent shift in government policy to hand over the smallholder irrigation schemes to farmers. These, along with public discussion about the new land policy as well as the continuing influence of multi-party politics, have served to generate and intensify competing claims over land and water.

The potential for small-scale irrigation along stream-banks and in wetlands is very high and particularly important for the majority of farmers, because formal irrigation schemes reach approximately half the number of informal irrigation farmers at present, a situation unlikely to change for some time.¹⁰ Nevertheless, the situation to date reveals serious problems that need to be addressed if the potential is to be realized. The first is the proliferation of conflicts over access and the related competing claims of rightful authority over the valued watered lands, and the role of policy changes in this situation. Second, there is the lack of coordination across key policies on land and water. Third, the latter policies as well as the new initiatives to transfer formal irrigation schemes to farmers do not pay adequate attention to the gardens on stream-banks and in wetlands in their multiple interactions with formal schemes. Finally, but pervading all the above, is the misinformation about how land and water are used in the 'informal' sector of small-scale irrigation.

III Patterns of access and use to stream-bank and wetland gardens in the Lake Chilwa Basin

Distribution of watered gardens

The existence of areas where watered gardens are found today is a product of several interacting processes – ecological and climatic, historical patterns of settlement, and current political and policy initiatives. The ecology of an area obviously has a determining role in the availability of watered areas. Villages settled along rivers and streams have a higher proportion of people with watered gardens than others. Similarly, villages settled in or near flood plains of lakes and rivers, or in low-lying land that becomes flooded in the rains, have more access to these gardens. Chilwa Basin is fairly well supplied with rivers, some of them perennial, and with wetlands in the lower-lying areas of rivers and around the lake itself, where the study sites are concentrated. On the other hand, the stony and eroded nature of river banks along parts of the rivers' length make gardens infeasible, and villages further away from the watered areas have lower proportions of their populations with access to watered plots. In the upland areas of the Basin, the proportion of farmers with stream-bank gardens is much lower.¹¹

The research findings also remind us that ecological conditions are not given for all time. Oral histories described how the massive floods along the Likangala in 1949 broadened the river bed, tore down banks, and washed away dryland fields that had

¹⁰ cf. Ngwira 1994.

¹¹ CSR 1990 (referred to without citation in Ngwira 1994), Peters 1992, Ngwira 1994.

stretched to the rivers. After the floods abated, people discovered that soil had been spread over large areas abutting the river, so creating the possibility for stream-bank gardens. While there have not been such severe floods since then, the periodic rise of the rivers in seasons of heavy rainfall often realign stream-bank garden boundaries. Usually, as we were told, people from one village ‘follow’ their gardens to the other side of the river where the floods ended placing them. In many other instances, neighbouring garden owners negotiate over garden boundaries reconstructed after floods. One result is that people do not necessarily have stream-bank gardens in the area controlled by their own village.

A second influence on who has access to watered areas is the historical pattern of settlement. There is a distinct pattern in the villages studied of long-term settlers and relatives of the village head’s lineage being more likely to have stream-bank gardens than others. This has also been found in studies in neighbouring areas in Zomba and Chiradzulu.¹² The original settlers acquired these gardens, which, over time, have been inherited within families (in this area, according to matrilineal inheritance). The villages in the Chilwa Basin were settled by Nyanja, some of them crossing Lake Chilwa from then Portuguese East Africa, and by Lomwe, all of whom came from the latter country. The dates of settlement in the study areas tend to cluster around the beginning of the twentieth century, though some, including villages just outside the study area, were settled in the previous century by Nyanja and Yao. Most of the Ngoni who moved into the area in the latter part of the nineteenth century, and who are recorded in village histories as causing mayhem, moved north. The village headships and chiefships are also divided among the three former groups, reflecting a history of considerable mobility of people for reasons of political divisions and war, resettlement for cultivation or trade, and in response to colonial rule.

These ecological and historical processes interact with more recent influences on the distribution of access to watered land. These include the establishment of formal irrigation schemes from around 1970, which took land from individual families under the ‘customary’ tenure of village heads and higher level chiefs, though in most cases with compensation in the forms of money, allocation of scheme plots, and/or of other land on which to cultivate and build houses. Another influence derives from the attraction of Lake Chilwa for fishing and fish-trading, which appear to have increased steadily over the past fifty years, albeit fluctuating according to the level of the lake, which periodically dries up. This attraction is not just for those already living in the vicinity but also for people from as far away as the Lower Shire and Central Regions. Oral histories specifically identify the influx of people coming to fish and trade in fish, but who then marry and/or decide to settle in the area as another source of demand for watered land. In addition, there is the fact mentioned above of the increasing value of access to such land which has been a major driver for people to seek access either through asking village heads and chiefs or through renting from existing owners. People in the study villages report increases in both the incidence and the rates of rent over the past years, a phenomenon also documented in villages along the Thondwe river in another part of the Chilwa Basin.¹³ It is in these more recent trends that the ability to pay is becoming as

¹² Peters 1992, Ngwira 1994, respectively.

¹³ Peters 1998.

common a cause of access to watered land as ecological circumstance or historical settlement patterns.

Distribution of access to stream-bank gardens in the research sites, use and livelihoods.

As noted in the introduction, villages settled along the rivers and in low-lying areas tend to have more access to stream-bank gardens than others, but even along the Likangala, there was considerable variation. Over sixty percent of the censused villages, for example, had less than a third of their inhabitants owning stream-bank gardens, while in one third between fifty and eighty percent of the inhabitants had such gardens. Within villages, because of the settlement patterns, the village head and his/her relatives normally have the most gardens compared with non-related villagers. A census of 425 stream-bank gardens in seventeen villages along the lower Likangala river revealed that, in half of the villages, between 85% to 100% of the gardens belonged to the relatives of the village head, and in most of the others, they owned about half of the gardens. In fifty percent of the villages, women were the reported owners of about half of the gardens, but in the remaining villages, women were listed as owners for one third or fewer of the gardens. Renting was reported for only 8% of the listed gardens, and these were disproportionately concentrated in two of the villages. Most respondents reported low levels of renting, the main reason being the value of cultivation in the gardens to the owners themselves. The rents quoted ranged between K100 and K1000 for a garden, depending partly on size, with the average being K360 out of the 35 cases. Although most of the village heads in the census tended to have somewhat more gardens than other villagers, only a few controlled such large numbers that they were able to rent out ten to sixteen gardens themselves. In sum, while most stream-bank gardens along the Likangala river appear to be family property, with village heads and their wider family owning rather more, a minority of village heads are able to run a type of rental business in the gardens.

Farmers using stream-bank gardens are unanimous in their opinions that these constitute the major source of cash income to their families, as well as contributing towards the family food supply. Some typical statements are:

“We depend a lot on stream-bank gardens (*dimba*). Yes, we also get crops from our dryland fields (*minda*). But we cannot do without our stream-bank gardens because all the money we get comes from our stream-bank gardens”.

“I depend on *dimba* – they are my source of income. That’s why I’m always busy with my *dimba*. Without *dimba*, life would be impossible”.

“From my *dimba* I made money that I used to buy fertilizer for my rice gardens and my dryland fields, as well as things for the house and family”.

“In the drought year [2001-2] I grew maize in my *dimba* garden and got about four months’ worth of food, so saving us from hunger that year”.

The main reason for this importance is that the watered gardens enable people to grow crops in the dry season when sources of food, especially vegetables (used as accompaniment, *ndiwo*, to maize or other staples), are scarce and when, most significantly, prices for fresh produce are at their highest during the year. This is the reason for the constant refrain that stream-bank gardens are the main source of cash

income for most people of the area. The main crops grown during the dry season in these gardens are sweet potatoes, tomatoes, water melons, maize to be sold 'green' (fresh) by the cob, pumpkins (whose leaves, *nkhwani*, are one of the most common accompaniments to the staple maize), and a wide range of vegetables such as onions, cabbage, eggplant, green leafy vegetables, and so on. A few respondents also said they used the gardens as nurseries for burley tobacco, a practice much more widespread in the upland areas of the Basin.¹⁴

Farmers said that there had been an increase in the cultivation of sweet potatoes and water melons in recent years, which appears to have been driven by market demand as well as, in the case of sweet potatoes, by the need to complement maize as a family food supply. One farmer, for example, emphasized the greater profits to be had from water melons, saying that, even if he got three harvests of maize out of his irrigated gardens, he would make about K15000 in sales whereas even one crop of water melons would bring him K45000. Prices do fluctuate considerably depending on overall supply and demand in local and town markets and on the numbers of traders buying a particular crop. Thus, several farmers in the late dry season of 2003 pointed out that whereas melons had been selling for up to K120 each in the previous year, they had dropped to K70 each or less (all depending, too, on size). Nevertheless, as the farmer said, even though he had expected to gross between K60000 and K80000 from his melons, the final figure of K53070 was "still good". Similar fluctuations occur with other crops, even the main crop of rice.

The stream-bank farmers overwhelmingly reported the primary importance of their gardens to be in providing cash income from crop sales, with the provision of household staple food – the usual definition of food security – placed second. Thus, 68% of the stream-bank farmer sample said that their main source of cash income was from their stream-bank gardens (*dimba*), whereas their main food supply was from their dryland fields (*minda*), followed by their stream-bank gardens. A few farmers in this sample who also had plots in the formal irrigation schemes, identified the latter as another source of cash income. While 81% of the stream-bank sample also cultivate plots in the wetlands (*dambo*), those fields come a distant third in both cash income and food supply compared with the other plots. As discussed below, this ranking is reversed for those living closer to the lake where dependence on wetland gardens is higher.

There is some variation in the relative importance of stream-bank gardens in supplying home food and cash income, however. The two main influences revealed by the research are ecological and weather conditions, and the winter TIP (Targeted Inputs Programme) distribution. The category of farmers who put most emphasis on the ability to grow maize for home consumption in their stream-bank gardens were those who live in the areas downstream of the major rivers and along the floodplain of the lake. These reported that, in years of heavy rainfall, even their upland fields often become water-logged, thus reducing their maize harvest. In this case, the stream-bank gardens are useful for producing maize in the dry season, as well as for the production of rice in both rainy and dry seasons (depending on water availability). Many rice producers use some of their rice to exchange for maize, bag for bag, since maize is the preferred staple. This pattern of growing maize in stream-bank gardens for home consumption has been boosted, too,

¹⁴ In more upland areas of the Basin where burley production is common, renting of stream-bank gardens for burley nurseries has steadily increased since the early 1990s, as have rents (Peters 1998).

by the distribution of the winter TIP packages, especially in those areas just mentioned. In most years, however, allocation of these valuable sites for growing maize for home consumption, which requires letting the maize dry on the stalk, is not the most profitable use, and farmers normally prefer to grow higher-value crops (including selling maize as 'green' or fresh cobs), using the income generated to obtain household maize.

During the rainy season, most stream-bank gardens are not cultivated because the crops (and sometimes even the land itself) would be washed away in the rising river levels, though sugarcane often remains along the edges. However, this again depends on ecology and weather. Hence, during dry years, stream-bank gardens are more likely to have some residual moisture by comparison with upland fields so they are used to grow the same range of crops mentioned, including maize. Gardens in the wetlands (described more fully in the next section) are used largely for rice in the rainy season, and in the dry season for the same range of crops as stream-bank gardens. Although, on average, stream-bank gardens are used mainly in the dry season and wetland gardens mainly in the rainy season, ecological conditions vary so that, sometimes, this distinction falls apart. Thus, in the smaller tributary streams of the main rivers, small wetlands may occur during the rains. Kampapwa stream that runs into the Likangala river is one example. There, if the rains are heavy, water remains in the stream for many months and rice gardens are made in the rainy season; whereas when the rains are poor, the area is used as gardens for vegetables and maize.

Distribution of access to wetland (dambo) gardens in the research sites, use and livelihoods.

An estimate for Malawi puts wetlands as 12% (259,000 ha) of total land available for cultivation.¹⁵ While the most extensive wetlands are concentrated in the floodplains of Lake Chilwa where the rivers flow into the lake, some smaller ones are found in low-lying areas in other parts of the Basin. They are scarce to non-existent in the upland sections of the Basin. In the sample of over a hundred irrigation scheme¹⁶ plot-holders, for example, 16% reported also having wetland gardens as compared with 29% with stream-bank gardens and 93% with dryland fields. Far more farmers in the stream-bank garden sample had wetland gardens (81%) in addition to their stream-bank gardens (100%) and dryland fields (98%). In both the samples, however, wetland gardens were far less important for both food supplies and cash income compared with scheme plots, stream-bank gardens and dryland fields. This contrasts with the sample of wetland garden users in the band of wetlands along the lake, described next.

The information on the patterns of access to and rights over wetlands comes from doctoral dissertation field research conducted (late 2003 into 2004) in four wetland areas selected from seven wetlands in the Basin, analysis of which is currently underway.¹⁷ In addition to the wetland gardens, 74% of the 170 sampled farmers also had dryland fields, 23% had an irrigation scheme plot, and only 3% had a stream-bank garden. This distribution, which differs from that of the Likangala stream-bank sample described above, reflects the ecological conditions along the floodplain of the lake where the rivers

¹⁵ Mloza-Banda et al 1994: 47.

¹⁶ See separate report on the irrigation schemes and the transfer process.

¹⁷ By Daimon Kambewa, with partial support from the BASIS Malawi project. Also see the separate BASIS report by Kambewa.

disappear into the lake, so lowering the availability of stream-bank gardens. The respondents placed their wetland garden crops as the number one source of livelihood support, followed by fishing and temporary labouring jobs. Furthermore, 83% said that dry season cultivation in the wetlands was most important in providing food for their family, the remainder emphasizing cash income from crop sales.

Unlike the Likangala stream-bank gardens sample, where many of the garden owners were related to the village headmen, in the wetlands sample, only 31% were so related. This difference derives from the fact that wetlands, earlier used for grazing, have come under control for cultivation more recently than stream-bank gardens, and to the related practice of headmen and superior chiefs allocating them to non-villagers. 61% of this wetlands sample inherited their plots from family members while 39% had them allocated by village heads and chiefs (referred to as chiefs from now on). As had been found in earlier qualitative research by BASIS researchers, some of the wetland plots were held on the basis of various conditions, especially that of giving the allocating chiefs annual 'thanks' or tribute. It was found that 44% of the sample had to pay tribute. Of those who had inherited the plot from their family, only 19% had to pay tribute compared with fully 82% of those who said their plots had been allocated to them by chiefs.

Of a sample of 156 who had cultivated a garden in the wetlands during the previous (2003) dry season, 141 or 90.4% described their plots as their own, whereas the remaining 15 (9.6%) both borrowed (12) and rented (4). However, 13% (18) of those with their own plots also borrowed and 11% (16) rented a plot. Borrowing occurs mostly among relatives and close friends, and occurs most often in the dry season, apparently because more people have access to watered gardens in the rainy season. Plots are rented both to neighbouring villagers as well as to 'outsiders' from other districts or towns (Zomba and Liwonde in particular).

The doctoral research shows that the dominant patterns can be understood as a matrix of inheritance/no inheritance and annual tribute/no tribute. The right of disposal to an heir is the strongest right currently recognized in the area. Despite the designation of 'customary' tenure to land held by smallholders, in the Shire Highlands, including the Chilwa Basin, most land, including all dryland and stream-bank fields and some wetland gardens, in practice is family property. The obligation to pay tribute, a term translating the Chinyanja word *chothokoza*, literally 'thanks', appears to be a modern version of an older tradition. In the past, those allocated plots by a village head or other chief would give a chicken and/or brew beer as a token of thanks. Today, in the densely populated Highlands area, this traditional token has long disappeared from the use of drylands and stream-bank gardens, almost all of which are inherited within families. Its use by the chiefs allocating wetlands plots against an annual payment has a very different connotation from the past token of respect and 'thanks'.

Analysis of the wetland garden sample shows that 83% (141) of the users have the right of disposal to an heir; of these, 31% (44) were allocated plots by a chief, with the remaining 69% inheriting plots from family. Thus, direct allocations by chiefs less often include the right to pass on the plot to an heir. Moreover, these allocations more often carry the obligation to pay tribute: even among the chief-allocated plots that carry the right to pass on a plot to an heir, 75% (33/44) have to pay tribute, contrasted with only 13% (13/97) of those who inherited the plot from family. These figures, along with the

conversations recorded in the field, suggest that the practice of paying tribute for a wetland plot has developed in recent years. As indicated later, it also appears to be spreading, despite opposition by some chiefs. Less severe constraints on tenure reported include the stated obligation to cultivate the plot every year, cited by 16% who inherited their plots from family, and 20% of those allocated by chiefs; and the obligation to be recognized as a 'local' person, cited by 27% of those allocated by a chief but only 5% of those inheriting.

The research also shows a strong variability in tenure types and tenure security across wetland areas and chiefdoms/villages. Two of the four sampled wetlands have a higher incidence of annual payments and lack of inheritance rights than the other two. In Likapa, 65% of the plots and 74% in Mpheta, are able to be inherited, compared with 98% in Khanda and 95% in Mposa. Similarly, Likapa has the highest proportion of plot-holders paying tribute at 81%, followed by Mpheta at 69%, with Khanda and Mposa much lower at 14% and 9% respectively. The largest constraint cited by respondents on their tenure of the plots was the obligation of paying annual tribute: 69% in Mpheta and 81% in Likapa said they will lose their plots if they fail to pay, compared with only 9% in Mposa and 14% in Khanda. The chiefs reportedly give concessions to those who are 'old' or sick, thus unable to produce large harvests, and in a minority of cases, users of multiple plots said they did not give the payment for each plot. Outside the wetlands sample, qualitative research in the main BASIS study of the area where the irrigation schemes are situated, also described a similar practice of a chief obtaining as many as 1000 bags of rice as annual payments for plots allocated in the wetlands.

What accounts for the difference across the wetland areas? One dimension is the size of the wetland – the two where the chiefs are renting out many plots are larger than the others. A more important factor seems to be the interpretation given by different chiefs to their rights and obligations. One chief living near one of those renting out wetland plots in the name of '*chothokoza*' adamantly denied that this was a legitimate practice. Another, however, said he was considering starting to do so because he felt that he did not receive adequate compensation for his work as chief and was attracted by the considerable rental income earned by a few of his peers. These practices and the disagreements they generate remain invisible, so far, to outsiders and constitute what is now a localized debate over the legitimate rights over wetlands. The issue is influenced, too, by the current process of transfer of the irrigation schemes. In the Likangala scheme, as is discussed more fully in a separate BASIS report, a few chiefs have appropriated some of the scheme plots, arguing that the land on which they lie belongs to them as first settlers. They claim ancestral rights over land that was appropriated by the government in the 1970s for the irrigation schemes.¹⁸ Along with this rationale, however, is a situation whereby some of these 'land-grabbing' chiefs (as they are described in local idiom) say that the reason some other chiefs are not seeking to reclaim the scheme land is because they earn a considerable income from renting out wetland gardens.

In short, the competition over access to gardens in the wetlands turns on competing claims of legitimate authority, and these debates are influenced and influence

¹⁸ This seems to have been perceived in the mid 1990s by an FAO team who reported that some villagers "particularly women ... [were] fearful and suspicious" of the team's visits, "especially when land issues were raised". This was attributed to "the legacy of past policies involving land-grabbing in wetlands to give to settlers" in irrigation schemes (FAO 1996: 5).

similar contestations over formal irrigation schemes. For their part, farmers using gardens along stream-banks and in wetlands tend to draw on the custom of inheritance of plots within families to claim that once chiefs allocate a plot, it henceforth belongs to the user. The implications of these for the land policy and more generally are discussed below.

IV Problems and Challenges for Small-scale Informal Irrigation

Increasing competition in use of rivers and watered lands

The main sources of problems and challenges for policy include the effects of fluctuations in weather and variable ecological conditions on rainfall and river flow; the management of upstream-downstream relations in use and rights over land and water; and the recent proliferation of competition over legitimate authority over watered lands. The study findings reveal the particular significance of the impact of new programmes such as winter/dry season TIP (Targetted Inputs Programme), the provision of treadle pumps, and the handover of irrigation schemes to plot-holders within a situation where there are already increasing pressures on watered lands. The challenges are for existing policies on land, water, and irrigation, for the current implementation of transfer of irrigation schemes to farmers, and for appropriate ways to support small-scale 'informal' irrigation.

Some of the constraints on the supply of water for irrigation derive from natural conditions. The two obvious problems are drought and the opposite, too heavy rainfall and flooding. Malawi has experienced both within the past decade or more and is likely to face similar instances in the future. In years of low rainfall or full drought, watered gardens gain even more importance because cultivation fails on dryland fields. Yet low rainfall results in shortfalls in river flow and, thus, in the supply of water to both formal irrigation schemes and to stream-bank and wetland gardens. In such conditions, the competition intensifies for these scarce sources of water and the land they flow through. In years of heavy rainfall, the problem becomes one of controlling the flow of water to irrigated gardens and the common danger of flooded and washed-out gardens. Again, these problems often set different categories of farmers against each other in their efforts to protect their crops. The implications of both sets of conditions – in low and heavy rainfall years – for assessing relative rights to water flow and to abutting lands are clear. They are seen particularly clearly in the relations between upstream and downstream users of water and in the assessment and management of their rights.

Similar to other situations where cultivation depends on access to scarce water supplies and where water sources are subject to multiple uses, upstream-downstream competition in access and use of water in the Chilwa Basin is critical to understand and control. The research revealed that the main competitors over the use of river-flows for cultivation are stream-bank gardens, wetland gardens, irrigation schemes, and private estates. These are also in order of the numbers of people involved though not in the relative draw-down of water from the rivers. In addition to use of water for cultivation, other uses include excavation of sand and gravel from the river-beds, consumption by animals, drawing water for brick-making, household needs (bathing, washing clothes, food processing and cooking, some drinking), and fishing. Nearer the lake, the use of seasonally flooded grasslands for grazing cattle and goats becomes a more common

competitor with cultivation and fishing, although reports suggest that grazing has decreased over the years as cultivation has increased.

There are three privately-owned estates in the Likangala research site, all growing flue-cured tobacco as their primary crop. Two are situated along the river and pump water from the river for dry-planting tobacco before the onset of the annual rains as well as for nurseries and later watering in a low rainfall year. The other, removed from the river, draws water from the river for its nurseries. This use of the river brings them into competition with stream-bank gardeners and irrigation schemes downstream. At present, only the estates have water permits so a large question is how the new water law that envisages all users of water for non-domestic purposes having to obtain permits will be put into practice in the situation of a large number of small users.

As in other parts of the Basin, excavation of sand and gravel has increased in the research sites, feeding the booming business of construction in the nearby urban and peri-urban sections of Zomba. A recent report says that Malawi's rate of urbanization, 6.3% per annum, is one of the highest in the world, and that the proportion of the population living in urban areas has increased from 14% in 1998 to an estimated 24% today.¹⁹ Since this trend is expected to accelerate even more, one implication is an intensified use of resources drawn from surrounding rural areas, including rivers, with potential positive and negative effects. The attraction of income from increased excavation along rivers, for example, is clear for people in villages along the rivers of the Chilwa Basin, who, like the majority of rural families in Malawi, draw on many non-agricultural sources of income. On the other hand, the effects on the water flows in terms of damage to banks and river beds, erosion, and silting are not well-studied. An important short-term need for income and livelihood appears to clash with the longer-term need to regulate and conserve rivers and riverbeds.

In addition to the excavation of building materials, the use of rivers for fishing as well as for grazing livestock and hunting mice along the banks has also increased, all of which are in competition with each other.

The most pressure on the rivers and streams, however, comes from the mounting demand for watered lands for cultivation. While stream-bank gardens (*dimba*) have long been valuable to farmers, all evidence suggests that their value has increased over the past thirty years, and appears to have accelerated in value over the past decade. This is reflected in a mounting demand from farmers for access to such gardens. Similarly, the demand for cultivation plots in wetlands (*dambo*) has sharply increased over the past decade. Causes of the increased demand for watered land include: the increase in population and, with it, a decline in the average amount of cultivable land available to families; the attraction of watered lands and their ability to provide double (or more) harvests for both food security and cash income; the influence of the irrigation schemes with their intensification of rice production, showing non-scheme farmers the attractions of rice production (especially with the improved varieties and methods) for both food supply and cash sales; the specific clearing and tilling of wetlands downstream of the irrigation schemes by the implementers in the 1970s as a means of extending the capacity for rice production to farmers outside the scheme; and the option provided by the high value of watered gardens of owners being able to rent them out, a tendency that has increased in past years, along with an increase in levels of rents.

¹⁹ The Nation, July 15, 2004, citing reports by the UN Centre of Human Settlement and DFID.

In summary, while none of these uses is new, overall use of water sources has increased over the past few decades. The research shows that the competition between users for water and watered lands has intensified over the past decade or more. In addition to these localized uses, there is the use of water further upstream by Zomba town and its expanding peri-urban areas, as well as the negative downstream effects of high levels of pollution from several urban sources.²⁰ There is also the environmental ‘need’ for water in terms of the health and diversity of ecological systems, a focus of other reports.²¹

The effects of programmes targeted at small-scale irrigators

The most recent influences on the patterns of use of watered lands and rivers come from the new programmes designed to encourage small-scale irrigation – the winter TIP distribution, the treadle pump distribution programme, and the handover of irrigation schemes to farmers.

Even though the winter TIP, especially the most recent one, delivered inputs to only a tiny fraction of those with watered gardens, the anticipation of gaining access to valuable inputs via having a watered garden has added yet another reason for people to do everything possible to obtain one. Another effect has been to create or exacerbate differences among villagers along the lines of haves and have-nots. First of all, as discussed above, the distribution of watered gardens is far more unequal than that of dryland gardens, and most studies (see above references) show a correlation between overall wealth and access to watered gardens. Thus, the winter TIP by definition does not target the poorest, despite stated criteria. (This is unlike the rainy season TIP).

Secondly, the BASIS research revealed serious deficiencies in the distribution of the TIP packages. While the criteria for identifying appropriate recipients were known and followed in some places, in more, they were unknown or confused, or there were more people fitting the description than there were available inputs, or the distribution followed not the official criteria but personal favouritism of the distributors, or the distributors and persons in authority appropriated and sold some of the input packages. None of this is unprecedented, having been seen with earlier distribution programmes, both in the research area and elsewhere. Nevertheless, people who did not receive the TIP winter inputs, but thought they should have, responded with dismay and anger. Two consequences were documented in the research sites. One was the splitting of existing villages into two, with a clear rationale for seeking to access future distribution programmes. Since the chiefly families of most villages already have longstanding debates and disagreements over which of the chiefly lines (within the matrilineage) should provide the chief, such splitting can occur fairly easily. The implications for administrative management, however, may not be positive. Another outcome was that people said that, since they did not receive any inputs, they were not going to contribute to any ‘self-help’ or ‘community’ project to which they were called to contribute: “Let those who received the benefits be the ones to contribute!” Again, this has been a response in other places when the distribution is not given to all villagers. This is one of the greatest problems with targeting programmes in a population where the majority feel and are, according to most standards, poor.

²⁰ See BASIS I reports on pollution along the Likangala deriving from Zomba town institutions.

²¹ GOM 2000a.

The programmes introducing treadle pumps promise a greatly enhanced level of productivity and, at least at first, an apparently welcome chance for farmers with access to watered gardens to gain a pump on credit. The specifics of the credit programme have proved disappointing, however, especially with reference to farmer groups, but also with respect to the timing of the arrival of the pumps and of the credit repayments. While there are a few groups operating quite well, more have proved either to be ‘ghost’ clubs, which in reality are the means for an individual to gain access to a pump on credit, or to have collapsed after some months. While failure of management, especially concerning procedures for sharing the pump, is involved in some, many respondents cited the fact that they had received the pump late in the season, thus losing the ability to plant and harvest in time. This lack of benefit from the pump clashed with the requirement to start repaying the credit soon after the pump arrived, so causing the break-up of several clubs.

Nonetheless, for those able to manage a treadle pump, this technology adds to the value and attractiveness of watered gardens. Like the winter TIP, distribution of treadle pumps cannot be seen as targeted to the poorest, even though its positive potential for increased productivity is a clear plus. Also, like the winter TIP, the sudden increase in the availability of pumps, whether on credit or for cash, has intensified people’s desire to gain access to watered gardens. Moreover, the longer-term implication of the spread of treadle pumps is further extension of watered gardens and increased competition over water sources. While the hoped-for productivity gains are important for a rural population living at low levels of income and food supply, the longer-term effects of the relatively sudden intensification of irrigated cultivation along rivers, in wetlands, and in river basins merit greater attention than has been the case so far.

The primary impact of new programmes (TIP, treadle pumps, handover of irrigation schemes) to date is to intensify not only existing competition in use, but also contestation over rights to watered lands, and debates over who has what authority over the allocation and use of these valuable land. The individual effects of each programme in this regard are greatly intensified by the coincidence of their implementation, and by their occurring in the context of decentralization and a political rhetoric stressing ‘freedom’ and ‘power to the people’ (*mphamvu kwa anthu*). A common effect of these new programmes is that, being targetted towards those with watered gardens, the latter become even more important to obtain than before. The disputes over watered land in the research sites derive from severe contestation over legitimate authority to allocate and use the valuable sites along rivers and in wetlands. A brief reference to past history helps explain the present situation.

Most stream-bank gardens remain in the hands of families (more specifically, sub-lineages or sections of clans) and derive from settlement patterns or from the effects of changes in rivers. Thus, these gardens, as is the case with dryland fields in this area, may be seen as family property despite their legal status as ‘customary’ land.²² (The Land Policy in fact makes specific note of this situation). There are few stream-bank garden areas unused and available to village heads or higher-level chiefs for allocation, the exceptions being the rare cases where there is no claimant from a family (usually to do with out-migration of all heirs). The increasing demand for the stream-bank gardens in light of their increasing value (see above) is reflected in the growing incidence of renting

²² Peters 1997.

and of the levels of such rents. And a few village heads control sufficient gardens that they make a little business out of renting them out.

Wetlands differ from stream-bank gardens in their history and appropriation. They appear to have become valuable for cultivation more recently but, like stream-bank gardens, have gained value from the new programmes directed towards small-scale irrigation. In the past, the wetland areas appear to have been treated as belonging to particular villages and chiefdoms with the relevant village or higher level chiefs allocating rights to use wetlands to those of their subjects requesting them. Oral histories from the research sites refer to the practice of showing thanks (*chothokoza*) to the chiefs by providing beer and/or a chicken, in the same way the allocation of dryland or stream-bank plots was treated in the past (but no longer). As the research findings cited above indicated, over at least the past decade, this concept has been used to describe practices that entail obligatory annual payments, more resembling rents and landlordism, in some but not all the wetlands.

It is in this context that new programmes have been put in place, such as the transfer of irrigation schemes, distribution of winter TIP and treadle pumps, and against which the current policy emphasis on small-scale irrigation of both formal and informal types must be set. There are three critical reasons for this emphasis. First, the policy actions and debates around small-scale irrigation are having effects on how different categories of the population are reinterpreting authority over land. Second, mistaken premises and insufficient consideration in policy documents and by implementing agencies about existing patterns of allocating and using watered lands contribute to confusion over legitimate authority. Finally, the complex ways in which uses of watered lands by different groups interact pose considerable challenges for management at all administrative levels and, in particular, for coordinated action across sectors. These are discussed in the next section with special reference to the new Land Policy, but with important implications for policy in closely related sectors of water, irrigation, and environment.

V Implications of the Research Findings for the New Land Policy: Discussion

A glaring omission from the new land policy document and from the plans for handover of irrigation schemes is any serious consideration of stream-bank and wetland gardens (*dimba*). The policy documents appear to consider all ‘customary’ land, with a partial exception for wetlands (discussed next), as equivalent. Yet, as discussed earlier, stream-bank gardens are one of the most valuable types of land, are unequally distributed, and are coming under extreme competition. Even though the number of stream-bank gardens is greater than the number of scheme plots (nationally as indicated above, as well as within a basin such as the Lake Chilwa site), the implications of the patterns of allocation and use of these gardens vis à vis the schemes have not been addressed. Similarly, there is not a single mention of these gardens in the land policy document, let alone a discussion of the challenges posed for the policy’s hope for more equitable distribution of land by the current inequality of access to stream-bank and wetland gardens (and to irrigation plots, as discussed in a separate report). This omission may well lead to gaps in the application of the policy.

A similar problem exists with reference to wetland cultivation. The land policy document makes a few references to wetlands (*dambo*) that assume them to be “common access” or “public” land within the overall category of “customary” land. It states in the Summary (A3) and in section 4.2.4:

“In the case of customary land managed by Traditional Authorities, common access land reserved as *dambos*, community woodlots, etc, will be classified as public land exclusive to members of the Traditional Authority only ... Within a Traditional Authority, the *community's public land* will include all and within the boundaries of the TA not allocated exclusively to any group, individual or family. This designation applies in particularly to *dambos*, dry season communal grazing areas, etc. Such common access or unallocated customary land reserved for community woodlots are regarded as public only to members of that community and will be protected.”

The assumption in the policy is that wetlands remain unallocated and are treated as common or public land for members of ‘community’, defined as residents in the Traditional Authority (TA). The premise is that the TA acts as trustee of such “common” lands. In fact, the situation in the wetlands, at least as described above for the Chilwa Basin, is different. In some areas, wetlands are treated in much the way other village lands are, namely, that resident families gain access to them, as a matter of right, through direct allocation by a village chief. In other areas, however, plots in the wetlands are increasingly being allocated by chiefs in return for a payment that is called ‘thanks’ (*chothokoza*).

Such cases clearly reveal a much less secure right of tenure than that found for dryland and stream-bank gardens described above as ‘family property’. Although the term ‘*chothokoza*’ implies a ‘tradition’ of showing ‘thanks’ to the chief, the obligation to pay an obligatory annual amount is akin to rents or a system of landlordism and tenancy. For a few chiefs, this is a profitable business: one unusually reported directly, and through his aide, that they monitored the plots so that they would know the state of the crop (usually rice) and preempt anyone not paying with an excuse of lack of harvest. For this chief, the usual collection amounted to over 1000 bags of rice. Some of this revenue is shared out among the relatives and close associates of the chief, some is ‘diverted’ into the private pockets of those collecting the payments, and some reportedly moves up the chiefly hierarchy. Needless to say, much of this information is difficult to obtain, let alone to put numbers on the flows. Nevertheless, it is clear that the practice has increased as watered gardens have become more attractive to farmers -- not merely the residents in the area but also those migrating in from surrounding districts and further afield. As discussed earlier, this practice is not universal but seems to be attracting some other chiefs to consider taking it up.

This practice, in turn, is influenced by and itself influences the emerging pattern of claims being made over the land of Likangala, one of the irrigation schemes studied. Here, some (but by no means all) village heads and superior chiefs have claimed that the ‘handover’ to farmers means that the land is being returned to its original owners. They thus have appropriated plots in the schemes, specifically those areas over which they claim ‘ancestral’ rights. While the justification has been largely in terms of reclaiming appropriated land (a rationale that has gained legitimacy from the government’s

condemnation of such appropriation under the Banda regime), several of those reclaiming ancestral land have actually accumulated several plots and are renting them out. This practice resembles both one that has developed on the schemes over the past decade or so, and that developing on the wetlands. One Village Head, who was claiming sections of the scheme as land for his villagers, specifically said that the reason one of his peers was not claiming land in the scheme was because he drew considerable income from the payments received from the wetland plots he allocates.

It is clear that the policy's assumption that wetlands (*dambo*) are treated as a type of commons is not upheld in the Chilwa Basin and is unlikely to be so in many other basins. While the assumption might hold in some parts of the country, in heavily populated areas like the Chilwa Basin where there is rising demand for irrigated gardens in the face of land shortage and of their increased value because of nearby urban markets for their produce, and also because of the influence of new programmes discussed above, the assumption is mistaken and obscures the real policy challenges.

From this situation, three main pointers emerge for the new Land Policy and its implementation. The first concerns the role of the chiefs/village heads in the reformed system. The Land Policy recognizes that the simple notion of chiefs as 'trustees' of land on behalf of the people under their charge does not reflect much of what is happening in Malawi. The Policy stresses that the 'customary' system is now marked by "increased land tenure insecurity and uncertainty" where "as the economy becomes more commercialized ... access rights defined by customary rules are also becoming more private and restrictive than before" (3.1.7). A key reason is identified as "fraudulent disposal of customary land by headmen, chiefs and government officials" (2.4.2 and 4.18.2).

The research in the Chilwa Basin supports this assessment but shows a more complex socio-economic and political situation where 'fraudulent' acts are entangled with struggles over legitimate authority over land. The situation on the ground shows different categories of the population drawing on elements of the 'ideal' customary system such as notions of trusteeship and entitlements based on family and locality as well as on more commercial or market ideas. The issue is not simply that "fraudulent disposal ... may deprive some holders of the right to land" but that, in a context where there just is not enough (usable) land for everyone to have a feasible amount, the social conflicts are over whose claims have priority over particular areas of land. What we see, in fact, is that various policy shifts – particularly the handover of irrigation schemes to farmers, decentralization of government, the new land policy – have intensified competition over valuable lands and have provided new or reinvigorated rationales for supporting claims, particularly that of locality. The claims of 'ancestral' or clan land vie with those of citizenship, and people who moved to areas to take up new opportunities, often decades ago, find themselves defined as strangers (*obwera*) by those claiming more ancient local ties. Village headmen and chiefs act as spokesmen for and defenders of the claims of ancestral ties but also act as business entrepreneurs in renting out plots in the wetlands. While there are certainly 'fraudulent' acts by some, the overall situation proves to contain more threads that need unraveling in order to understand how the policy changes, so far, have intensified rather than reduced social conflict over land.

The implications for the reforms envisaged by the new land policy include the role of the 'traditional' authorities at all levels in the allocation and management of land

and in resolution of disputes over land. First, these authorities cannot be seen as ‘neutral’ figures because their interests are inextricably entwined with the control over land. Hence, while the longstanding respect accorded these roles (if not the specific incumbents) suggests they ought to be included in the new land administration, they should be treated as one among the knowledgeable persons on the committees. The Land Policy specifically warns that “Holding land in trust for citizens does not make a Headperson, Chief, or any public official the owner of the land” (section 4.3.1). But there needs to be a much more public outreach to stress this, and also far more explicit limitations placed on their roles in the new committees than either the White Paper on the Land Policy or the Implementation Strategy (2003-2007) paper does.

A second conclusion concerns the wetlands (*dambo*). The land policy provides an option for wetland areas to be privatized by a group and to be made a ‘common property’ (section 5.6.1d):

“Any grouping of families and individuals living in a locality or having customary land rights in a defined area that seeks to protect their common property interest or “dambo” shall be recognized and legally protected as common property.”

However, as discussed above, the situation is already far more complex than this picture. At present, many of the *dambo* areas are not common property in the implied sense that all residents of a locality have equal access to them but are treated as property by a minority of persons with claims to ‘traditional’ authority. In a paragraph subsequent to the section just quoted, the land policy document notes the possibility of competing rights or ‘interests’ and states: “In all such cases, whether the interest is registered or not, the grant will also include all existing rights and encumbrances from the person granting the title. Thus, in cases involving transactions in land, it makes good policy sense to require, that before any transaction can be concluded or safely effected, it is necessary to inspect and demarcate the land.” While this latter suggestion seems sensible, the former sentence still assumes that “all existing rights and encumbrances” can be incorporated rather than that there are incompatibilities among existing uses and rights that will need far more detailed analysis and action than ‘demarcation’.

A third implication for the land policy is that, as noted, the policy document does not even mention the special value of riverbanks, even though stream-bank gardens are very numerous in many areas of the country, are increasingly valuable for reasons explained earlier, and have become a focus of government and donor desire to raise agricultural productivity. Since such gardens abut and depend on rivers and seasonally flooded areas, including ‘wetlands’, they cannot be treated in the same way as dryland gardens, as is the implicit assumption in the policy documents. Here, the inter-dependency of the land and water provide a challenge: promoting irrigation in sites along rivers and wetlands requires a much more integrated and coordinated approach from authorities in Land, Agriculture, Water, Irrigation, and Environmental management departments.

VI Suggestions for Review of the New Land Policy and Related Policies²³

²³ Some of the points in this section derive from discussions at the workshop on National Policy held in August, 2004 by the Malawi BASIS team and with participation by representatives from key ministries and

1. In light of the signal importance to family livelihoods of ‘informal’ irrigation along stream-bank and wetland gardens revealed by the BASIS research and corroborated by other research in Malawi, more specific attention to them is merited by authorities in respect of the implementation of the new policies on land, water, and irrigation.
2. Stream-bank gardens: while most of these gardens appear to be held as family property, despite their currently legal ‘customary’ tenure status, their dependence on rivers that are increasingly subjected to multiple uses raises the issue of the status of the rivers and water flows. According to the new water policy, all users of water for production will be subject to acquiring a water permit. This seems infeasible for the millions of river-bank gardeners. One option is to identify and authorize the universe of users of a stretch of a river as members of a land and water management committee along the lines of the Land Policy’s identification of a land management group. This group would have the authority to oversee allocation of gardens and other uses of riverbanks and water (such as sand excavation), and to use any revenue or part thereof forthcoming (such as from permits) for the management of the river under their care. Such a group would be a sub-unit of the proposed Catchment Authority and be linked to the District Administration. Since it is unlikely that the Catchment Authorities will be formed soon, the relevant higher unit could be the watershed. This would enable proper coordination across land, water, wildlife, and environment management, and give a voice to smallholder farmers in the new management institutions.
3. Wetlands (*dambo*): In parallel with the above option for stream-bank gardens, wetlands already allocated to families could be identified as land and water management group, and constitute sub-units under the relevant District and Catchment Authorities. Where wetlands remain unallocated, they could similarly be placed under the same groups. This would mean that chiefs who have effectively privatized wetlands by demanding an annual payment for plots would lose that privilege and become ordinary members of the management groups.
4. In all matters of land and water administration, it must be emphasized that ‘traditional authorities’ at all levels (village heads, group village heads, and TAs) are not ‘neutral’ in respect of land and should not be accorded special authority in the new management groups.
5. Concentration of ownership or control over stream-bank and wetland gardens: It may be hoped that should groups of users be given authority

departments dealing with land, water, and irrigation, as well as non-governmental organizations working on the same topics.

to manage land and water (as above), the existing cases of concentration of ownership and rentals described above would cease. In cases where this does not happen, one option is to insist that redistribution of such concentrations be carried out.

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