

Malawi Environment Monitoring Project: Nsipe EPA 4 Study

Trip Report

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1. Introduction

This report details work carried out by Gumbo, Jambo and Kabambe over the period December 10, 1998 to January 8, 1999 as a partial contribution towards a study assessing the social and environmental impacts of market liberalization on smallholder agriculture in Malawi. The working field trip was planned as the **information analysis stage** of the study focusing on generative interviews, the analysis of common themes from the initial research, in-depth focus group interviews, institutional profiles, synthesis, and village feed back. While this initial timetable was adhered to, the more practical aspects of the work shifted somewhat to a revision of the survey instrument, completion of transect walks, and the commissioning of airphoto interpretation for the selected villages, although focus group interviews remained as a major component of the work-pack. While the team's October/November 1998 report provides base information on the methods of the study, this trip report takes the process further by providing preliminary results.

Village feed back meetings that were earmarked for this trip had to be postponed until March 1999 as delays were experienced in the completion of focus group interviews. Focus group interviews were not carried out in Kanjati village.

2. The Study's 'Big Question' -- What is the effect of market liberalization on the environment?

The broad assumption of this study is **that environmental degradation was already taking place in some parts of Malawi, Nsipe included, but was accelerated by a combination of market liberalization and other related causes.** The study focuses on smallholder agricultural production.

3. Approaches to the study

The nature and form of the question compelled that a cross section of complimentary methods of inquiry and analyses, encompassing and directly addressing both the biophysical and social contexts of the smallholder farmer in Malawi be used. Sight was not lost of the need to ensure that the outputs would strive to provide both a **method of work** and the actual **analyses** with which to inform policy and decision makers.

3.1 Biophysical

- 3.1.1 Ascertain, through satellite imagery and time series analysis whether there has been land cover change, and in particular, the conversion of woodlands to arable or arable to woodlands.
- 3.1.2 To confirm through ground-truthing and social transects whether the changes identified in 3.1.1 are correct.
- 3.1.3 Ascertain through aerial photo-interpretation that agricultural expansion has occurred into marginal lands (i.e., encroachment into riverbanks, dambos (wetlands), and any land with slopes greater than 12.5%).
- 3.1.4 Process detailed in 3.1.2 will be repeated for the output of the Air photo analysis (presently planned for March 1999).

3.2 Social

- 3.2.1 Determine through household and focus group interviews the underlying causes of land cover change.
- 3.2.2 Establish social transects in each village to obtain farmer confirmation and explanations of change noted in 3.1.1.
- 3.2.3 To obtain, through household and focus group interviews, farmers' perceptions of the noted changes taking place, impacts on the environment, as well as, visions of the future.
- 3.2.4 Establish through household and focus group interviews, how the farmers' economic and political decisions and actions contribute to land cover change.
- 3.2.5 Seek to establish through **timelines and trend analysis** the social and historical explanations of environmental degradation.

The relationship between the two data sets generated will be one where the two would reinforce each but more importantly the quantitative will verify the qualitative thereby enriching the analysis and the explanations of change.

3.3 Village Selection

Six villages were selected through the combination of remote sensing, a District Officers' meeting and a rapid appraisal of the villages. Each village answered to a key aspect of land use and change. Regardless of this, the underlying question centered on whether market liberalization had contributed to and/or accelerated change in terms of that particular aspect of land use or resource use system. The key indicators that were established are outlined below:

- 3.3.1 Reduced livelihood security (Kanjati village)
 - **Key indicators:** reduced nutritional status of children (especially the under fives). Explained through low agricultural productivity, a switch to cash crops, lack of land, or the lack of a capacity to respond to external initiatives.
- 3.3.2 Enhanced livelihood security (Semu Chimwala village)
 - **Key indicators:** Increased cash crop (tobacco) production, high levels of crop switching, agricultural expansion and intensification, increases

in symbols of accumulation, soil and water conservation measures adopted, amount of food purchased, nutritional status of under fives improved.

- 3.3.3 Encroachment and /or conversion of State Forest Reserves (Kasale village)
- **Key indicators:** switch to cash crops leading to a demand for more land, commons unavailable and thus encroachment on government reservations, foraging and illegal extraction of woodlands products from forest reserves for sale.
- 3.3.4 Encroachment and /or conversion of customary forests (Khuzi village)
- **Key indicators:** are the sacred woodlands, hill-side woodlands shrinking and what are they being converted to, who is allocating these lands, how much are these changes driven by the need to grow cash crops?
- 3.3.5 Managed village and/or community woodlands (Kachimanga village)
- **Key indicators:** effectiveness of the community based woodland management strategies, ability to withstand the pressure of demand for more land as farmers go into cash cropping, striking a balance between woodland needs and agricultural production, link between woodland products and agricultural production (use of humus for example).
- 3.3.6 Intensive agriculture (with and without soil and water conservation) (Pheza village)
- **Key indicators:** approaches to intensive agriculture, soil and water conservation measures adopted (or not), limitations to intensification, related production levels, levels of crop switching, how limited is agricultural expansion into community woodlands.

All the indicators were incorporated into the study's survey instrument and were further addressed in focus group interviews, timelines, and trend analysis. Focus group interviews are still outstanding for Kanjati village.

4. Methods of inquiry - Questionnaire development

The development of the study's household survey instrument was an iterative process involving the research team, the village based enumerators (VBEs), extension workers, and the farmers. The steps followed are outlined below:

- The first draft developed at Clark was used as part of the VBE training.
- Modifications made on the basis of VBE knowledge, role-plays, timelines, and one social transect. The major changes centered on making the instrument address smallholder agriculture within the cultural setting of Nsipe EPA.
- Pre-tested in all villages (total sample was 18 households), a review showed that the instrument was too long and questions on land ownership were vague and difficult to translate into Chewa.

- The results of the pre-test showed, at this early stage, the centrality of the village headman to land issues. A conflict of opinion was noted in that the VBEs had observed that most of the land was in the hands of Family Heads. This meant that extra care had to be taken in the redrafting of the instrument so as to be able to accommodate new insights and knowledge.
- Second draft administered to 33 households across the six villages. Preliminary analysis indicated that there were some gaps in the questionnaire and it was established that the gaps were emerging from the translation of the instrument into vernacular. The VBE debriefing session translated the questionnaire into Chewa, then into English and then back to Chewa again. In this process the questionnaire was redrafted. In addition some of the responses (based on frequency) were inserted into the questionnaire, thus reducing the amount of time taken to administer the instrument per respondent.

The study involved a total of 1574 households and it was decided to use a stratified random sample to ensure that women and men were proportionally represented. This was a crucial aspect of the survey as Nsipe EPA has both patrilineal and matrilineal households and the village lists supplied indicated this phenomenon. A sample of 12.5% was adopted. The total number of questionnaires administered by the VBEs was 213 and almost all are now in and are being analyzed. It must be pointed out that another 61 questionnaires, completed during the instrument development phase are also available and provide useful additional information.

Analysis of the questionnaires yields the following information:

- That the individual farmer is more conspicuous than the community. Questions on community actions to forestall environmental damage invited a “**nothing**” as the most prevalent response indicating the **lack of a community spirit** so essential in the management of common property resources.
- Almost all the land allocation in the villages studied is being carried out by Family Heads (*Wankulu walima*) instead of the village headman who has no more common land to allocate.
- Environmental change encompassing woodlands and soils is noted but attributed to the increasing population.
- The standing solution to soil infertility is the application of fertilizer and, in fact, most farmers seem to consider the **lack of fertilizer** a more serious problem than **soil infertility itself**.
- The solutions to tree shortages and deforestation centered on a call for more stringent conservation laws, forest guards, and ‘free’ seedlings from the central government.
- The people envision a treeless, unproductive landscape unless the central government steps in and does ‘something’ about the impending disaster. There appears to be no role even for the local leadership, let alone the community.

4.1 Social transects

- A total of six transects were walked (including a training one), based on mental maps produced by the villagers. The following type of information was captured: **land use, soil type, crops, vegetation, erosion or signs of, measures adopted (if any), problems, and on the spot farmer explanations of changes.**
- All transects were walked with farmers who identified trees, indicated when land was last cultivated, ownership, soil types, etc.

The transects proved to be an important source of information but more importantly showed the predominance of a mixed agriculture/trees landscape where land fallowing is a strategy of those families with a lot of land. Discussions with farmers vis-à-vis land ownership along the transect showed how a few families seemed to “own” all the land. Transects also helped the research team form ideas about the state of the environment in the villages. Grazing lands were found to have scant cover with severe sheet and gully erosion quite apparent. The upper (near base of hills) and lower (riverbanks) slopes are being opened up for arable agriculture. On consulting with the farmers we were told that for the upper slopes this was a recent phenomenon while for the lower slopes cultivation started as way back as the farmers could remember.

The major type of soil conservation measure was found to be the ‘ridge’ with variations of box ridges on some arable lands. The most prevalent method for stopping gully erosion was the planting of **sisal** and/or **bananas**. The planting of Blue Gum in “**individual woodlots**” on common land was widespread and the mango and guava on arable lands were equally outstanding. As for the indigenous trees, *F. albida* and *P. thonningi* appear to be preferred species on arable land.

4.2 Trend analysis

- Each VBE carried out a trend analysis discussions through a discussion with the Village leadership. Major milestones related to the adoption of ridging, land allocation mechanism, the arrival of high yielding maize varieties, fertilizer, etc.
- Similar trends were picked up for the adoption of soil and water conservation techniques.
- Periods when the shortage of trees and/or tree products became visible or felt were noted.
- Changes in soil quality, linked to the cultivation of marginal land and/or continuous cultivation
- Trend analysis was also a major part of the focus group discussions to be carried out in January.

The output of the trend analysis when coupled with the focus group discussions gave the impression that change had preceded the **advent of market liberalization in Malawi**. In most of the villages, change in agriculture was thought of as being centered on population

increase and the demand for new land. Episodic changes were noted as being the adoption of new high yielding maize seed varieties, fertilizers, and ridging. While they are conversant and aware of when and how tobacco came to their villages, most farmers were of the opinion that they were ‘ripped-off’ by early ‘middle-men’ and therefore stopped growing tobacco altogether. Also conspicuous in their discussion on issues related to change in agriculture is the role of the colonial estate in their adoption of crops and cropping practices, which included clear felling of arable lands, although farmers retained some trees on arable lands (see 4.1 above). Of concern here is the **limited or no reference to the Malawi Government’s extension efforts** (issue to be pursued through key informant interviews in March 1999)

The current state of the woodland deforestation is explained through a number contemporary and historical causes which are as follows:

- The colonial government’s centralization policies (c.1930) consolidated traditional villages, which through re-zoning necessitated the translocation and re-construction of new homesteads on a massive scale, meant that, not only were trees cut for construction, but there was also some clear-felling for arable agriculture. In some instances, as in the case of Kachimanga, the new homes were on the former arable lands indicating that new arable lands had to be opened up.
- Some villages like Khuzi and Pheza actually incorporated into their boundaries some clear felled former estate lands.
- The colonial government’s timber cutting system allowed wood merchants to remove any amount of trees from the villages for a fee, while mining concerns, such as those active in the Pheza area, received special concessions to remove timber from the villages as well.
- The **defiance of ‘colonial conservation laws’** initiated a passive resistance against the colonial authorities by the Nyasaland Congress Party that was never reversed and has contributed to the current status of natural resource conservation, especially as regards riverine and dambo cultivation.
- The rise of the “*mwachifuniro chake*” (do as you please) ethic, a post democracy development, is leading to the widespread destruction of natural resources and seems to be an extension of the defiance dating back the 1950s.

Changes in water quality and quantity were noted but were camouflaged by the numerous boreholes dug across the EPA.

4.3 Seasonal calendars

Six calendars were produced for the study area and showed that land preparation, weeding and harvesting are the most labor demanding activities in the villages. When read together with the household responses to the survey instrument, the calendars demonstrate the importance of labor (*ganyu*) to the large farmers (*achikumbe*), as well as, to the labor providers.

4.4 Timelines

- Establishment of the environmental histories of the villages.
- Considered the political economy of the same including its leadership, main food sources, valuable resources and who were the major exploiters.
- Focusing on soil fertility, land allocation, and the adoption of cash crops.
- Sought to establish periods of major environmental change as recalled by the villages.
- Are a major component of focus group discussions.

Analysis of timelines was fused together with the trend analysis. The key years in terms of environmental history were the early 1900s (villages established), 1930s (centralization and re-construction of villages), the 1950s (the ill-fated federation with the Rhodesians, the massive exportation of labor (Wenela), the fight for independence), 1960s (independence and the Banda years), and the 1990s (multi-party democracy). Also noted are the 1940s for the adoption of ridges as conservation measures coupled with tenancy farming of burley tobacco. The timelines, however, cannot be generalized for all the villages as each had distinct and unique experiences.

4.5 Focus group interviews

A total of 15 focus group discussions (three per village) were carried out. The activity was not carried out in Kanjati village where the village headman did not make the necessary arrangements for the meetings. Three groups were set per session where one was made up of the elderly people (both female and male), another of middle aged farmers, and a third of the village leadership. The groups looked at a number of topics but focused more closely on the historical perspectives of environmental change in the village, contemporary analysis of environmental and agricultural change, and the village institutions' interpretation of change.

Focus group interviews enabled the research team to get additional views and added dimensions to the environmental change within the villages, most of which had been obtained in the household component of the study. The discussions showed a three-stage process of change starting with the colonial period through the Banda era to post-democracy. There was remarkable consistency in the explanations of the farmers' and external agencies' roles in the change process in each village. Most notable was the worsening status of the soils, inequities in land distribution, enmass movement of village populations (centralization policies) leading to massive deforestation, and the galloping population growth. It was noted that the village headman, without any common land to distribute, was virtually powerless and his/her power was being usurped by the *achikumbes* who still have large tracts of family land to distribute.

5. Emerging themes

This study addresses questions on market liberalization and its impact on the environment. In framing this question five specific questions were raised and the sections below provide some of the preliminary answers to the questions.

5.1 General

- 5.1.1 Image analysis indicated the dominance of mixed agriculture and woodlands, a change also noted in the social aspect of the survey. What seems to be emerging is the fact that these villages have mosaics of arable and fallow lands, and woodlands. Carrying out time series analysis will not yield anything more significant unless it is the same season imagery. What has been noted is the form of **change by itself**.
- 5.1.2 Air photo-interpretation using the 1984 and 1995 photographs covering each of the selected villages should show agricultural encroachment into marginal lands as well as unsuitable lands.
- 5.1.3 That household and focus group interviews confirm changes detected through GIS and remote sensing but offer a number explanations for these changes.

5.2 Is there contamination of ground and surface water, including Lake Malawi, due to increased use of fertilizers and agro-chemicals?

The methods employed in this study do not readily answer this question, although some questions in the survey instrument sought to establish noted changes in the quality and quantity of water.

- 5.2.1 Although water quality issues seem not to predominate through out all the villages, there is a steady recognition that surface water sources are declining (i.e. no longer last throughout the year). Reduction in the quantity of water available to communities has been blamed on tree cutting along the stream banks leading to the siltation of the water bodies. Farmers in the Semu Chimwala village claim that the removal of trees, especially **Syzigium cordatum** along river valleys (**for the construction of tobacco sheds**), is leading to the siltation of pools and other surface water bodies on the local rivers. Absent in this analysis is that rivers have catchments and the farmers have to note the length and breadth of the problem.
- 5.2.2 With the exception of Semu Chimwala and Kanjati villages (to a lesser extent) which obtain potable water from streams, all the other villages obtain theirs from boreholes and/or piped water schemes (there is a claim that boreholes were drilled after 1994). Most comments pertaining to changes in water quality are from the Semu Chimwala village only.
- 5.2.3 Farmers in Semu Chimwala village, where there has been widespread cultivation of tobacco and fertilizer use, claim that they have observed that river water (main source of drinking water) is now losing taste, especially over the dry season. In addition, as the rivers dry up, the water is developing a distinct smell. Through focus group discussions it was found that there is widespread use of “soap” and other cleaning substances in these rivers whose impacts are felt more strongly when the river flows are reduced.
- 5.2.4 Kanjati village is sending out mixed signals. The research team saw a polluted pool of water in one of the local rivers and the farmers explained that it was due to the use of washing soaps in stagnant water.
- 5.2.5 No ideas seemed to emerge as to what the villagers, and indeed what government, could do with water quality issues (except drilling more boreholes), but a

combination of tree planting and more stringent conservation laws from the central government were advocated to curb the removal of riverine vegetation.

5.3 Is there agricultural expansion onto marginal and unsuitable areas?

Household and focus group interviews have addressed this question and confirmed that there has been expansion of agricultural lands into marginal areas. It is anticipated that the air-photo interpretation being carried out should help to answer this question fully. At present, however, the transects and the focus group discussions confirm the following:

- 5.3.1 That expansion into marginal (over 12.5% slope) and unsuitable areas (dambos and riverine areas) has been taking place for quite a while and in fact long before the advent market liberalization.
- 5.3.2 Expansion could be explained in the following ways:
 - Unprecedented increases in the village populations leading to pressure on resources as well as calls for more land.
 - Democracy and the rise of the *mwachifuniro chake* (do as you please) ethos (almost a return to classical tragedy of the commons scenario).
 - The interactive relationship between **democracy, population pressure**, and the land shortage explains the latter day land grabbing taking place in most of the villages. Most of the land is in marginal areas.
 - Inequitable land distribution where the bulk of the land is in the hands of a few *achikumbes*. The landless families have started to grab 'for the children' regardless of the quality of the land.
- 5.3.3 Most conversions seen on satellite imagery result from either the sub-dividing of 'family fallow land' or the cultivation necessitated by the need to rotate crops, or land leased to neighbors to cultivate.
- 5.3.4 Market liberalization has not featured as an explanation of land use change, with the exception of Semu Chimwala, Pheza and to a lesser extent Khuzi, but is competing with a number of alternative explanations of agricultural expansion.
- 5.3.5 Expansion of agricultural land has been noted in Khuzi (Dzunje hill), Semu Chimwala, Kanjati but limited in Kasale, and almost non-existent in Kachimanga and Pheza. Pheza is the oldest village.
- 5.3.6 Agriculture as a land use is moving up the slope and as of now the landless and/or family outcasts are opening up marginal land. A good example comes from Khuzi where the lower slopes of the Dzunje hill have been opened up for cultivation.

5.4 Is there a reduction in fallow periods or increases in continuous cultivation?

- 5.4.1 There is an obvious elimination of forced fallow (i.e., as the land lost fertility the farmers would carve out new pieces of land) due to the shortage of land. Even the larger *achikumbe* farmers are facing the reality that they have to continue to subdivide their land among their offspring as there is no other source of land.

- 5.4.2 Potential fallow land is also being reduced due to sub-divisions within the family or the land is being ‘rented out’ to needy families so as to be able to lay claim through the continued cultivation of the land. Idle land may be re-allocated by the village headman.
- 5.4.3 All the villages claim that they now practice continuous cultivation that is impoverishing the soils.
- 5.4.5 Land allocation by families shows changes in traditional village land use categories where residential land is coming out of fallow, indicating that need far outstrips demand.

5.5 Does deforestation and continuing cultivation lead to increased soil erosion and loss of soil fertility?

- 5.5.1 All the farmers claim that continuous cultivation has rendered the soils ‘tired’ and that the solution to this problem is an increase in the use of fertilizers.
- 5.5.2 Deforestation is widespread in all the six villages but is exacerbated in Semu Chimwala, Khuzi, and Pheza. The farmers blame this development on tobacco growing.
- 5.5.3 In addition, deforestation has been explained as a break down in conservation laws started by the Nyasaland Congress Party and now rejuvenated by the multi-party democracy as the *mwachifuniro chake ethic*. In addition, poverty and low returns in agriculture are forcing the farmers to sell anything which is permissible in terms of their understanding of the meaning of market liberalization (including firewood).
- 5.5.4 Alternative explanations to deforestation exist in the amounts of wood used in brick molding (0.67kg/farm yard brick) and beer brewing which require fairly large quantities of “wet” wood.
- 5.5.5 Now that ‘ridging’ has become a way of cultivation, boxes ridges and ridges on contours, there is a widespread lack of soil and water conservation measures on the majority of the arable lands.
- 5.5.6 There is also a notable absence of agroforestry intervention except for the protection of *F. albida*.

5.6 Do increased rural incomes resulting from market liberalization lead to increased adoption of soil and water conservation practices?

- 5.6.1 The adoption of soil and water conservation measure has been highest in Pheza but not necessarily in Semu Chimwala which has made the most money from tobacco. Adoption of conservation measures in Pheza dates back to the 1940s, and though related to tobacco growing, the conditions under which this took place had nothing to do with investments in conservation works
- 5.6.2 The average tobacco farmer will use fertilizer in his/her crop while the burying of crop residues remains an option for maize and groundnut farmers.
- 5.6.3 For the farmers, ‘hiring labor’ was needed mostly for land preparation (ridging). We could consider this as an indirect investment in soil and water conservation measures.

- 5.6.4 There is nothing to suggest that increased incomes are leading to higher rates of adoption of soil and water conservation partly because the solution to soil fertility problems is viewed as the application of fertilizer. Presently, most tobacco growers get fertilizer through their respective clubs.
- 5.6.5 The Land Husbandry Assistant's report on conservation works carried out in these villages shows that farmers are doing very little by way of conservation works.