10. Agricultural policies and forestry development in Malawi, Mozambique, Tanzania and Zimbabwe: Complementarities and conflicts

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ABSTRACT

This paper presents a review of agricultural policies deemed relevant to the management of natural forest resources in Malawi, Mozambique, Tanzania and Zimbabwe. The competition between agriculture and forests for land and the role of man in influencing the balance between the two requires an articulation of sectoral, extra sectoral and macroeconomic policies in order to minimise undesirable policy effects.

The paper presents a brief review of evidence from studies carried out in different parts of the world on the influence of agricultural policies on deforestation. This is followed by a review of agricultural development in the pre-independence and postindependence periods in Malawi, Mozambique, Tanzania and Zimbabwe, paying particular attention to agricultural policies that shaped and continue to influence the sector and their consequent effects on forest development.

Key words: Deforestation, shifting cultivation, land tenure, commercial/estate agriculture, economic reforms, smallholder farmer.

1. INTRODUCTION

While forest conditions affect opportunities for national development, the development process shapes what these forest conditions are, and what they will become. The use, development, and conditions of forests are fundamental consequences of the wider configuration of national policy and economic development. National development is constantly creating incentives and capacities to exploit and enhance forest resources. Economic growth and social conditions tend to shift the location and composition of forest resources. Understanding how national policies affect forests provides the basis

for achieving desired types of forest conditions, including the aggregate contributions they provide, and the required trade-off with other national objectives.

Arguably, policy failure outside the forest sector may be even more important (World Bank 1996). Government policies relating to trade, land, relative prices, taxation, expenditure and subsidies provide incentives (positive or negative) in other sectors that often have detrimental consequences for forest resource use and conservation. This is particularly true to agriculture, the principal source of forest depletion and degradation, and the mainstay of future economic growth and poverty alleviation, especially in Sub-Sahara Africa.

The adoption of an inter-sectoral approach to address forest management issues has been partly due to the inability of traditional forestry strategies to contain deforestation and forest degradation, and the fact that the root causes of forest degradation and depletion are often found outside the forestry sector (de Montalembert 1992).

Agriculture is critically dependent on environmental resources such as land, water, forest, and air. However, the use of these resources can affect directly or indirectly, other natural resources, through dynamic and complex interrelationships existing in the natural systems. This implies that wrong use of land, water, and forest in the production of crops and livestock can have far-reaching effects on environmental integrity. To avoid any adverse consequences, agricultural sector policies must fit in the overall environmental policy. This is critical in guiding proper and balanced use of natural resources and in defining sectoral responsibilities for environmental management. Agricultural policies, besides being internally consistent, must provide for a mechanism to link the sector with other sectors in protecting and enhancing environment.

This paper examines the evolution of agricultural policies and their influence on forestry development in Malawi, Mozambique, Tanzania and Zimbabwe. This shall provide a cross country comparison of influences of these policies and identify trends that are of regional nature from those specific to individual countries. The paper does not always develop quantitatively the causal linkages between the policies and forest condition but combines a qualitative assessment of the situation prevailing in these countries with results from quantitative studies on such phenomenon from other countries. This is due to the scarcity of quantitative studies in these countries on this subject.

As a proportion of total land area, forest cover in these countries is estimated at 43%, 71%, 47% and 51% respectively (Nyasulu 1997). In all these countries forests are the main land users followed by agriculture. These two sectors compete for land and other resources and at times with disastrous effects on the environment. Further agriculture and agricultural processing form the backbone of the economies of these countries. The hypothesis is that deforestation and environmental degradation is partly a result of previous agricultural sector policies, which had no built-in incentives to safeguard land and natural forest resources. These disincentives are related to land size, ownership and use.

The paper is organized as follows: The second section gives a brief overview on how policies directed at the agricultural sector have influenced forestry development. The third section examines the evolution of agricultural policies in the pre independence period in these four countries. The fourth section extends the analysis to the post independence period. The final section summarises the main implications on forestry development in these countries.

2. AGRICULTURAL POLICIES AND FORESTRY: AN OVERVIEW

Although the potential for agricultural production is far greater now than in Malthus's time, the environmental impacts of farming systems raise concerns on long-term sustainability. The challenges vary greatly from one system to another. The agricultural sector, which is composed of both the livestock and crop components, hinges on the exploitation of land resource (soil and vegetation). In this context, it has direct and indirect influences on the indigenous forest resources in terms of their exploitation and conservation. The direct effects result from the competition for land between forests and agriculture while the indirect effects result from the exploitation of the forest resources either for subsistence purposes (food, energy, building material) and/or for income. Wanton deforestation and land degradation are a reflection of unsustainable land use emanating from poor agricultural and poverty related policies in most Sub-Saharan African countries. Many studies have demonstrated the potential effects of agricultural policies on the forest condition. Unfortunately, there are only few such studies in the four countries that explicitly show the link between agriculture and forest condition when compared to similar literature for other parts of the world. Thus, it is important for these southern African countries to glean at experiences from other countries in order to understand the potential implications of some of the agricultural policies they adopt. However, caution should be exercised because in some cases the magnitude and direction of some agricultural policy variables still remain inconclusive as shall be demonstrated in the evaluation of individual policy effects below. This section provides a very condensed account of this. Kaimowitz and Angelsen (1998) provide a good account of tropical deforestation while Angelsen and Kaimowitz (2001) provide a detailed account on influence of agricultural technology on the forest condition. However, only a few policy impacts are highlighted because of their relevance in these four countries, and especially at present when these countries are implementing economic and institutional reforms, referred to as Structural Adjustment Programmes (SAPs). The SAPs employ most of these policies.

(i) Prices of agricultural products and inputs

The effects of input prices on forest degradation are mixed. Fertilizer price increases were reported to have had practically no short-term effect on land use (Ruben et al. 1994; Monela 1995). However, Monela (1995) suggests that they increase deforestation in the long run. Holden (1993, 1997) and Nghiep (1986) found that higher fertilizer prices lead farmers to change from sedentary farming to shifting cultivation and to clearing more forest land. Increases in prices of pesticides, seeds and hand tools, together with high interest rates were found to reduce forest clearing (Ruben et al. 1994; Monela 1995; Ozorio de Almeida and Campairi 1995).

Reduction of subsidies on inputs has shown mixed results on expansion of cropland area. Removal of fertilizer subsidies had little effect on cropped areas in Tanzania, in areas where fertilizer use was low (Aune et al. 1996). On the other hand, Mwanawima and Sankhayan (1996) report that eliminating fertilizer subsides contributed to deforestation in Zambia. In Mexico, Barbier and Burgess (1996) argue that reduced fertilizer subsides and elimination of price support for maize has direct negative effect on maize profitability, leading to area reduction. On the other hand, the shifting of labour from maize to competing crops leads to area expansion. The net effect of such policy measures on deforestation is therefore indeterminate.

Agricultural product prices have been found to lead to expansion of cropped areas

(Angelsen et al . 1999; Barbier and Burgess, 1996; Deininger and Minten, 1996). Agricultural prices behave more like exogenous variables when export products are involved and the countrys' total exports of those products are too small to affect world prices. When agricultural prices are exogenous, policies taxing agriculture will reduce deforestation while subsidized agriculture will increase deforestation. High agricultural produce prices reduce the period of time that farmers leave their land fallow, thus reducing the areas of secondary forests (Jones and O'Neill 1992, 1993). The effect will be stronger when agricultural supply is price elastic.

Subsiding public rural road construction, protectionism, high guaranteed prices and eliminating trade and marketing policies that act against agricultural production will increase deforestation. Reduction of agricultural crop export taxes generates similar effects as currency devaluation (Thiele and Wiebelt 1994). Fiscal subsidies have also been found to stimulate deforestation (Andersen 1996; Barber and Burgess 1966; Pfaff 1997).

Taxes (Ad Valorem and export taxes) and tariff on agricultural activities causing deforestation protect forest cover. This is due to their negative effects on profitability emanating from low prices (after tax), biding up of rural wages, or raising the costs of agricultural inputs (Jones, O'Neill 1993d, 1994).

Credit availability promotes deforestation by allowing farmers to expand cropped areas or pastures (Monela 1995 in Tanzania; Ozorio de Almeida, Campari 1995 in Brazil; Deininger, Minten 1997 in Mexico). On the other hand, indigenous households in Bolivia and Honduras have been found to clear less forest after they had received credit (Godoy et al. 1996, 1997). This reduction is attributed to reduced dependence on forest-based activities to smooth consumption and income or to increased involvement in off-farm employment to repay loans, leaving less time to work on farms.

Devaluation promotes deforestation through its incentive effects on the expansion of tradable agricultural products (von Amsberg 1994). Aune et al. (1996) found that real devaluation prompted agricultural land expansion in Tanzania, both through increasing output prices and by having land substituting agricultural inputs in response to input price increase. Similar results have been reported in Zambia (Mwanawima and Sankhayan 1996). Trade liberalization generally tends to increase deforestation (Lopez 1993; Maler and Munasinghe 1996).

(ii) Agricultural technology

Technologies that increase farm yields have also been shown to have mixed effects on forest resources. If a technology increases marginal productivity of land, it can stimulate deforestation (Katila 1995). On the other hand, it may lead to land being substituted by labour or capital, which in effect reduces deforestation. Angelsen et al. (1999) claim that when technical assistance was provided, cropped area expanded rapidly in regions with high fertilizer use in Tanzania. However, Deininger and Minten (1996) indicate that the reverse was the case in Mexico. Increased farm productivity has been associated with less total forest clearing in Brazilian Amazon (Jones et al. 1995). This could partly be due to the fact that farmers who successfully avoided soil degradation had more productive land and thus had no need to compensate for lost productivity on degraded lands by clearing forests. Godoy et al. (1997) report that indigenous farmers with higher rice yields in Honduras clear less forest each year. This contrasts with the observation by Foster et al. (1997) that agricultural productivity growth at the village level had a high positive correlation with deforestation. According to Southgate (1994), deforestation is higher in places with technologically stagnant agricultural sector.

(iii) Roads and market access

It is argued that landholders are most likely to convert forest to agricultural use in areas with good access to markets and favourable conditions for farming. Forest conversion for smallholder agriculture requires different levels of market access and types of soil and climatic conditions in comparison to large-scale mechanised farming (Chomnitz and Gray 1996). Roads induce greater forest clearing in areas with good soils and favorable climatic conditions. Chomnitz and Gray (1996) show that the probability of an area being used for agriculture (rather than natural vegetation) on high quality land next to the road was 50%. Godoy et al. (1997) found that households in villages far from urban markets clear less primary forest, but they hypothesize that such villages have more secondary forest available for clearing. Liu et al. (1993) and Mamingi et al. (1996) have shown that forest clearing declines rapidly beyond distances of two or three kilometres from a road, although in some case forest clearing is associated with longer distances. According to Mertens and Lambin (1997), deforestation drops off dramatically beyond 10 km from the nearest town. Locations closer to urban markets (in travelling time) are more likely to have less remaining forests (Chomnitz and Gray 1996).

(iv) Stability of political and social institutions

There is no consensus on the effect of political stability or political system on deforestation. Deacon (1994) claims that in politically stable countries deforestation is less compared to politically unstable countries. Didia (1997) argues that democratic counties suffer less from deforestation while Shafik (1994) notes that the same is true for authoritarian regimes. Deforestation is also said to be higher in places with more unequal land tenure regimes (Rock 1996).

3. PRE-INDEPENDENCE DEVELOPMENTS

The present structure of agriculture in the four countries is closely linked to past events, stretching from pre-colonial time. The transformation of a hitherto purely subsistence agriculture to semi-commercial and commercial agriculture continues to change the form of the relationship between peasants and their natural resources. This section traces such events and lessons from the pre-colonial and colonial periods.

3.1 Pre-colonial period

The period considered in this section is that very close to the colonial period in the 1800s due to scanty information on deforestation in the distant past. Historically, removal of forest cover has been closely linked to population growth, until when it was possible to establish the population-agricultural land connection. This formed the basis of forest transition, occurring in Europe in the early 19th century. Thus, there is a long-term trend of deforestation and forest degradation determined primarily by population growth, but also (and increasingly) shaped by other factors such as economic growth, trade, technologies, ecological factors, and policies. The risk is that if these underlying factors and long-term trends are not acknowledged, one might blame only the more recent policies for deforestation while it is known that there are underlying causes of deforestation linked to the pre-colonial period. For example, historical records (e.g., pollen analysis, archaeological studies) have shown that deforestation and land degradation did occur in pre-colonial time (Siiriäinen 2000). Environmental manipulation

started with the Neolithic modes of production (agriculture), a revolution completed more or less 1500 years ago in Sub-Sahara Africa. Regional deforestation occurred long ago in various parts of Africa. The earliest large scale forest retreat started about 2000 years ago, when Bantu speaking farmers occupied large parts of Eastern and Southern Africa. A second wave took place about one thousand years later, coinciding with high charcoal demand for iron production. Production became intensive in many densely populated areas, with large clusters of settlements taking hold during the 13th and 14th centuries. Exhaustion of soils in these areas, combined with high population growth, resulted in less productive land being cleared and put into use, something which resulted in practices such as the chitemene in Zambia. Misana et al . (1996) report that changes in the miombo woodlands have taken place in phases starting with the pre-colonial long distance caravan trade characteristic of the 1700s and 1800s followed by some pre-colonial era tribal migrations such as that of the Ngoni, the rinderpest epidemic, the introduction of the plough and the market economy.

In the pre-colonial period agricultural production was based on traditional technology with shifting cultivation or fallow systems as the means to maintain labour productivity and to regenerate soil fertility (Abrahamsson and Nilsson 1994). Low population density in most areas permitted long periods of fallow, which contributed not only to soil fertility regeneration but also allowed forest regeneration. Although shifting cultivation was one of the major agricultural production practices, this was not carried out indiscriminately. Some areas were reserved for other functions such as water catchment protection, livestock grazing as well as religious rituals and ceremonies (Kjekshus 1977).

Traditions and/or customs prevailing at that time in the clan or tribe governed the ownership of the means of production and assets, i.e. land, labour, livestock and the little farm implements. Thus, the problems related to or arising from the "haves and have-nots" never arose in most societies. It is also true that feudal societies developed in certain groups, such as the Nyarubanja systems in Bukoba, Tanganyika (Mbilinyi et al . 1974). However, no part of the family or clan was left to suffer because of scarcity of land, labour, lack of tools or implements.¹

Production and distribution systems were organized such that whatever was being produced or gathered was geared first to family needs, second to the clan, third to the tribe and only finally to the inter- and intra-tribe trade. Thus, local resources were mobilized and utilized to produce commodities or products that were needed locally by the community, contrary to the so- called modern agricultural sector which was in some cases geared almost wholly to the export sector (Mbilinyi et al . 1974; Negrão 1995). There is no evidence however, to suggest that land use for agriculture and the associated production technologies led to unsustainable exploitation of forest resources. Kjekshus (1977) concluded that.... "The pre-colonial economies developed within an ecological control situation - a relationship between man and his environment which had grown out of centuries of civilised work of clearing the ground, introducing managed vegetation, and controlling the fauna".

With increasing population pressure and shortening fallow periods, people evolved agricultural practices that addressed the land degradation processes through, for example, crop-rotation, inter-cropping as well as multiple-cropping (Kjekshus 1996). In Tanzania, it is now known that by 1500 AD there were stable and permanent societies in Kilimanjaro, West Lake (Kagera) and the Southern Highland areas (Omari 1976, Illife 1971). The same is true in the case of Zambezi delta in Mozambique where local communities were planting perennial crops such as coconuts and bananas (Negrão 1995).

Indigenous knowledge was used to maintain soil fertility and conserve water for agriculture as well as livestock. People managed to establish agricultural land suitability using simple indicators (plants as well as soil colour) (Trapnell 1937). For example, soils were given names on the basis of their property and, more important, their suitability for crop production. An example is Mbuga (vertisols) soils in Sukumaland farming systems of Tanzania that indicate dark heavy soils found in the valley bottoms (Budelman et al . 1995). In some cases indicator plants were used to assess the suitability of land for crop production, which also aided the decision on whether to clear the land or not. Cultivation techniques also evolved to address soil erosion problems and water management. The "matengo pits"² in Southern Highlands of Tanzania and majaluba³ (in Sukumaland) are examples of the strategies that were evolved to maximize the utilisation of water for agricultural production.

Food crops dominated agricultural production during the pre-colonial period. These were meant to cater for household food requirements, social obligations, and for local trading.

The geographical location of Mozambique and Tanzania on the coast brought the coastal local communities in contact with the external world as early as the fifteenth century. These contacts were in the form of trade in ivory, wax and later slaves (Newitt 1997) The slave trade disrupted the settlement patterns as communities were forced to abandon their settlements to seek refuge in areas of poor access and low agricultural potential (Negrao 1995). In the case of Tanganyika (Tanzania mainland), it has been reported that slave trade flourished because slave labor was important for clove plantations in Zanzibar. There were constant caravans either of slaves or labourers from mainland to Zanzibar. Illife (1971) and Baumann (1891) claim that the Zanzibar slave plantation economy could not have survived if people from the mainland did not produce enough food for the Zanzibar market. This introduced cash economy to the mainland people and the practice continued up to the time of German's rule.⁴ With the abolition of slave trade, oilseeds and copra became important products traded by local communities in exchange for cloth, beads and alcohol (Negrão 1995; Newitt 1997). These trade contacts provided a new dimension to the relationship between the peasants and the natural resources, as it involved the exploitation of natural resources for commercial purposes. However, lack of or inadequate infrastructure to the hinterland might have restricted such trade to only few accessible areas.

There is little evidence to show that during the era most close to the colonial period crop production strained land/forest resources in most areas. The exception would be areas with high population densities and easy access by international traders. However, there is evidence to show that growing land scarcity in highland areas of Kilimanjaro, Meru and Pare Mountains of Tanzania necessitated movement of people to other parts to open land for agriculture. Omari (1976) notes that the people in these areas began to cultivate and settle on the slopes of mountains.

To sum up, low population densities in most areas, existence of customary rules governing the use of natural resources and local knowledge about the environment explain the limited degradation of land and forest resources during this period. In those cases where trade contacts existed with the external world, lack of infrastructure limited the extent of exploitation of forest resources for commercial purposes.

3.2 Colonial period

The partitioning of Africa during the Berlin Conference of 1885 legalized the colonial control of African natural resources. This saw the 'nationalization' of land and other natural resources like forests and wildlife belonging to various communities into state land, forest and game reserves. This disrupted the way local communities lived and related to their natural resources. Further, the colonial administration created a dual agricultural-led economy characterised by peasant/smallholder and commercial sectors. The commercial sector, referred to as estate sector in some countries like Malawi, had access to the most productive land while the smallholder sector was mainly relegated to marginal lands. There was massive forest clearing in both sectors for crop production and supporting infrastructure.

3.2.1 Confinement of peasant farmers and build up of environmental pressure

There were various developments in the peasant and commercial sectors, which contributed to forest conservation and degradation. In the peasant sector there were moves that reduced and restricted peasant farmers to fixed land areas, irrespective of their increasing human and animal populations. Further, there was deliberate segregation in the provision of agricultural services, with the commercial sector and export crops receiving more attention. There is also evidence of restricting certain crops to estate/commercial agriculture, to the disadvantage of smallholders. These and other events are evaluated in this section as well as their bearing on forest sector development.

In Zimbabwe peasant farmers were confined into communal and resettlement areas. The Land Apportionment Act of 1930 facilitated the alienation of land among the races. Increasing population pressure in the communal areas resulted into landlessness, and by 1978 half of the African population was landless, up from 30% in the late 1950s (Moyo et al . 1995). These African farmers occupied less than 50% of the arable land in the country at independence in 1980. The reserves constituted about 90% of the communal areas (in which 2/3 of the population lived), and are located in poor ecological zones for agricultural production (Chenje et al . 1998). In the communal areas the farms averaged 5 hectares per household, which was the minimum size for subsistence farming. According to Chipika (1998), in the peasant sector (communal farm sector) land increased by about 21% between 1961/62 and 1981/82 (and has not increased appreciably since then), while the number of households and cultivated area increased by 144% and 204% respectively. Further, grazing area remained relatively unchanged, while the population of cattle and goats increased by 78% and 67% respectively, during the same period (ibid .).

In Mozambique, the initial colonial administration was effected through settlers who were given large land concessions (prazos⁵) for which Portugal retained the mineral rights. From the second half of the seventeenth century to late eighteenth century, these concessions were not used for agricultural production but acted as a source of labour for ivory and slave trade. The families occupying land in the concession areas were required to pay tax (in kind -produce and labour) and sell their surplus produce to the prazo owners (Newitt 1997). Although customary land tenure system at the village level within the prazos was not affected, the peasants had effectively lost the right over the land through the requirement to pay tax for its use (Negrão 1995). In 1891, a distinction was made between land already conceded and lands under the jurisdiction of the state. Within the land under the jurisdiction of the state, the natives had a right to a title of

holding for the land they occupied, and the title could only be exchanged among the natives on the basis of customary laws. Commercial agriculture was only initiated in early 1870 when the Mozambique opium cultivation and trading company was established (ibid.). Coconuts and sugar cane were the first crops produced on large scale. In 1901, legislation was passed allowing the natives to have access to 1 hectare of land per hut within the area conceded to the settlers. In 1909 the land title of holding by natives was repealed and a category of land reserves for natives was created. Within the reserves, land occupation was flexible, but without a right for a title of holding.

The coming to power of Salazaar in 1928 marked the end of the prazo system and Portugal assumed direct political control of the entire territory of Mozambique. Only companies or settlers who were productive and undertook genuine investment were retained (Newitt 1997). The economic policy of Portugal required its colonies to be producers of raw materials for its industry, and Mozambique assumed a central role in supplying raw cotton to Portuguese textile industry. Cotton became a compulsory crop and villages were assigned quotas that they had to meet (Newitt 1997).

Although the introduction of commercial agriculture did not per se create landless families, the rural communities were forced to occupy marginal lands with limited irrigation possibilities and with poor market access (Negrao 1995; Newitt 1997).

Further, the success of the labour intensive commercial agriculture required a guaranteed supply of cheap labour. Forced labour (chibalo) for agriculture was mainly in the central and northern provinces. The southern provinces became labour reserves for South African mines (Abrahamsson and Nilsson 1994). Forced labour for agriculture was one form of tax payment introduced by the colonial government (Negrao 1995). This meant that families had less labour time to allocate for subsistence production. Although the forced labour laws and forced cultivation of cotton and rice were abolished in 1961, their effects are even felt today. Cotton crop for example is still considered as a slave crop.

The Portuguese policy meant that in the peasant sector cultivation could no longer be carried out with the same flexibility since land access was restricted. At the same, time male labour for land clearing was less available and the absence of complete property rights reduced the range of incentives for land improvement. In addition, use of land, as security to access credit was not possible. The actual effects of these changes on the forest resources have not been documented.

In Malawi a similar pattern emerged, with the colonial policy promoting land alienation to European settlers. Many people subsequently moved on to European estates thereby losing all their original rights. African land rights were left in great ambiguity, which made their position insecure and created difficulties for the future (Phiri 1991). Estate owners were allowed to charge rent to all Africans on the estate. The estate owners preferred tenants who worked in lieu of cash rent. Paying "rent" for land that Africans believed was theirs but "bought" for so little by Europeans led to conflicts between tenants and settlers (Minde et al. 1997).

Effectively development of agriculture was at two levels, viz. estate and smallholder. This then put in place an asymmetry in agriculture development which remained up to the present time, and which formed the basis for allocating government attention and resources for developing the sector. The government decreed by law that certain cash crops be exclusively for estate or smallholder farmers. Further, the customary land tenure system discouraged the development of the rural credit market for individual smallholder farmers because the land could not be held as collateral for loans. This was because customary land was communally owned and the chief, in consultation with community elders, allocated it to individuals.

As the number of settlers increased, the pressure on land became greater, because settlers acquired land mainly from fairly high densely populated areas. The displaced Africans were confined to small and marginal lands and on the settler estates as tenants. Due to land conflicts, the land given to settlers was gradually returned to Africans, and by independence in 1964, most of the land had been returned to traditional customary control. In 1948 the land under European freehold amounted to 490,000 hectares, about 4.1 % of the total land area of Malawi. This percentage was reduced to 3.7 by 1954 and less than 2% by 1964. Therefore, at independence in 1964 about 87% of the land in Malawi was under customary ownership (Kachule et al. 1999). The 1962 "African Private Estates Bill" and the 1964 "Malawi Land Bill" suggested that future land policies would centre on customary law (Minde et al . 1997). However, considerable damage had already been done on the environment and especially on estates or plantation agriculture, which necessitated clearing of large forest areas, as well as on marginal lands, which supported high African populations.

Tanzania faced settler (albeit to a smaller extent as compared to the other countries) and plantation agriculture on one hand, and a cash crop oriented peasant agriculture on the other. Prime agricultural land was allocated freehold, mostly to German settlers on the slopes of Mount Kilimanjaro, Mount Meru and Usambara Mountains with the assistance of collaborative chiefs (MLHUD 1995; Hyden 1980). Sisal and cotton plantations were established in coastal areas. Although land clearing was part and parcel of plantation agriculture for crops like sisal, coffee, and sugarcane, the establishment of flue-cured tobacco and tea had significant implications for forest resources as these crops required wood for crop curing in addition to land for their cultivation. In order to ensure that agricultural production was in line with colonial objectives, long-term land leases were given to estate producers. Most land in Tanzania is covered by miombo woodlands, which are potential areas for livestock keeping. However, due to presence of tsetse flies, the strategy to eradicate tsetse flies led to massive clearing of trees to pave the way for livestock husbandry (Kjekshus 1977).

Hyden (1980) argues that the German colonization of Tanganyika not only put an end to the prosperity of the indigenous pre-colonial economies but also gave rise to a number of diseases and natural catastrophes. Further, the German colonial policies wrecked the fragile balance between man and nature on which the pre-colonial economies rested. Colonization disrupted the man controlled ecological systems that supported pre-colonial economies. For example, evidence suggests that the German Government by then could not generate enough revenue outside the peasant sector given the growing revenue demands by the state (Hyden 1980). The Governor of the then German East Africa (Tanganyika) forced Africans in 1901 to grow cotton as a revenue generating measure despite the fact that the crop had shown dismal performance in northern parts of Mwanza and Musoma (Magoti 1984). Thus, taxation of the African population in Tanganyika (introduced in 1897 as a hut tax) was further reinforced to ensure compliance. People became employees on plantations or directly involved with growing cash crops to ensure that tax was paid. Efforts to promote agricultural production were accompanied by extensive opening up of forested land for plantation agriculture and supporting infrastructure. The Germans were not very successful in agricultural production and by the time World War I began only sisal showed uninterrupted growth.

The British Government showed little interest in expanding large-scale agriculture partly due to failure of settler agriculture in Uganda in 1920s (Mamdani 1976). Land alienation continued but remained small in terms of the area. By 1958 the estate or plantation sector covered approximately 1.0 million hectares with only one-third of this area actually used under plantation or other farming (Ruthenberg 1964). Most of the estate or plantation owners were British or Greek although there were also some Indians and Pakistanis. The plantation sector again depended on hired labour, often recruited far away to ensure that family demands would not interfere with their work. Labour recruitment was done by compulsion, as there was no shortage of land that would have forced peasants to seek employment in plantations.

British policy of indirect rule tried to expand peasant agriculture. Ordinances were the major instruments used to achieve agricultural development under peasant agriculture. The coercive approach was passively resisted by peasants⁶ leading to low agricultural productivity (Ruthenberg 1964).⁷ By mid-1950s the British shifted to persistent persuasion approach towards peasant agricultural development. By that time, however, the effects of the earlier policies to improve peasant agriculture had already changed the political situation in favour of the nationalist movement for independence.

In all these four countries emphasis on agricultural production by settler/estate farmers was the motive for withdrawing good land from natives and confining them into marginal lands and/or smaller productive land units. The spatial arrangement of smallholder and commercial farmers was legally put into place. The scene was then set for the smallholder African farmers to eke a living from 'confined', small, and mostly low productivity land units, given their fast increasing human and animal populations, and many other demands. A tremendous pressure on land and other natural resources was created leading to environmental problems that the colonial governments unsuccessfully tried to contain. A few examples highlight this.

In Malawi, the importance of agriculture to the economy of the country as well as to the livelihoods of the people was recognized and an attempt was made to develop the sector (Minde et al. 1997). Lack of resources hampered development of the sector at a time when 95% of agricultural land was under Africans whose population was doubling every twenty-five years. This created problems in that shifting cultivation was increasingly becoming limited due to scarcity of land. This gradually led to soil exhaustion with declining productivity accompanied with increasing maize mono cropping. Crop rotation scarcely existed for maize with only a few inter-planted legumes.

By the end of the World War II, Tanganyika (now mainland Tanzania) already had developed and underdeveloped areas. During this time the so-called developed areas were already facing land problems due to erosion and low productivity on one hand and population pressure on the other. To address these problems, the British colonial government introduced cultivation measures that would improve land husbandry and productivity⁸ (Omari 1976). Although different schemes were initiated not only did they end in disastrous failure but also resulted in opening up of forest resources.

In Zimbabwe, overstocking and overgrazing is attributed mainly to little marginal land reserved for natives in 1920s and further concentration of natives in those areas through legislation in the 1950s and 1960s. However, by the end of the 1920s there was evidence of degradation in the native areas as the farmers increased land under cultivation in order to cope with taxes and falling grain prices. Livestock numbers were also increasing compounding the degradation problem. During the same period land held by settlers increased from 20% to 50% of the total land area. Livestock

management and conservation attempts under a 1951 Native Land Husbandry Act, including de-stocking attempts met with stiff native resistance (Chipika 1998). Further, the concentration of people in reserves shortened the fallow periods, moving from woodland fallow to bush land and finally to grassland fallow. This led to not only decreased soil productivity but also to increased labour demands (ibid.). Ironically whilst the Zimbabwean African reserves were getting overcrowded and severely deforested and degraded, by 1973 only 4% of the land allocated to the settlers was under cultivation with most of the land reverting to woodland (Riddell 1979).

3.2.2 Strategies in agricultural production and their effects on forest condition

Having secured land for settler farmers the colonial authorities organized other inputs and services for agricultural production in favour of settler farmers. The inputs manipulated were labour and other production incentives like crop prices, extension and marketing services.

(i) Marketing and pricing

In Mozambique, the peasant farmers were deliberately discriminated in two ways, viz., through controlled prices for which the Portuguese settlers were paid higher prices than the peasant farmers, and through controlled low wages to guarantee cheap labour supply to the plantation agriculture (Branco 1994). In Zimbabwe, Nhira et al. (1998) report that for the same crops, prices were deliberately made low for peasants and higher for commercial farmers. Such a system indirectly encouraged peasants to sell their labour to commercial farms, mines, and urban centres and to other sectors.

Different policies in marketing of agricultural produce from the estate and smallholder sector influenced Malawi's agricultural production in diverse ways. Crops grown by the estate sector were sold on the export market. These were marketed by private agents or in private auctions to foreign buyers. On the other hand, smallholder farmers had access to two types of markets. The first were local markets where produce was sold on small scale at whatever price the buyer could offer; and the second were markets administered by the colonial government such as the Tobacco Native Board and the Maize Control Board. The asymmetric marketing arrangements arose in the early 1920s under the influence of the estate owners. The estate farmers produced for the better-priced export markets.

(ii) Labour

In Mozambique forced labour (chibalo) for agriculture was mainly in the central and northern provinces. Forced labour for agriculture was one form of tax payment introduced by the colonial government (Negrao 1995). This meant that families had less labour time to allocate for subsistence production. Further, in order to guarantee an adequate supply of raw cotton to the Portuguese textile industry, cotton was made a compulsory crop in 1921. Rice cultivation was made compulsory in 1941 to feed the urban population. In Malawi, Africans on estate farms paid rent in form of their labour to the estate-owners. This in essence was one form of exploiting the Africans. Furthermore, the Africans, who at that time were commonly known as the "Natives" were disgustingly employed under a wage agreement only to be paid in kind, thus in some case the natives would simply be given cigarettes or tobacco as their payment. This was known as the "Thangata system". The involvement of the local communities in this manner reduced labour available for smallholder production. In Tanganyika, any portion of the territory, which was not the locus of large-scale capitalist investment or whose people did not generate local products for cash sale automatically, became a labour reserve (manamba). By 1903 the German colonial Government required local leaders (akidas and jumbes) in the southern coastal districts to establish cotton plots worked by communal labour.

(iii) Credit and extension services

The availability of credit, extension and marketing services was almost non-existent to smallhoders. For example Chipika (1998) report that only 2% of smallholder farmers had access to these facilities when Zimbabwe became independent in 1980. The implications included perpetuations of old farming practices and low crop productivity in the peasant sector. In Zimbabwe, commercial farmers who had access to these facilities evolved modern farming methods and saw farm yields rising to about four times those obtained from similar crops and on similar acreage in communal farms (ibid.).

Peasants in Tanzania had no access to credit partly due to lack of meaningful collateral and they could not borrow from private traders since under the Credit to Natives (Restriction) Ordinance of 1923 no debt was legally enforceable against an African other than one holding a license (Msambichaka, Mabele 1977). However, non-Africans could borrow from commercial banks existing at that time. Land Bank was established in 1947 to provide credit to non-Africans. In 1957 the minimum bank loan was raised from £10,000 to £15,000 (IBRD 1961), which was very much out of reach of indigenous smallholder farmers. Thus, along with coercing people to work on foreign owned export oriented plantations, the colonial government ensured that settlers received credit to expand agricultural production. Given the limited resources to peasants. their response to this economic opportunity was phenomenal (Msambichaka, Mabele 1977).⁹ Credit programmes for peasants were initiated later but geared towards producing export crops. Thus, if availability of credit was associated with expansion of export crop production then the impact on forested lands was much more severe in areas where export crop production potential was high. Overall, credit programmes during the colonial period were pre-occupied with export crops.

In Mozambique, an attempt to create agricultural credit facility for the natives was only made in 1940 when the indigenous credit fund was established. This fund was to be accessed by the natives considered to have attained a certain level of civilisation. The first meeting of the fund was only held in 1958 and no credit was conceded (Negrão 1995).

(iv) Traditional vs. government institutions

No serious efforts were devoted to harmonizing traditional institutions in agriculture with government institutions, and at least exploiting the complimentarity of the two. For example, when it came to livestock development policies, governments' emphasis was on beef and dairy products, while the peasants emphasis was on manure, milk, draught power, prestige (in numbers), cultural and social needs. It was not suprising that destocking policies failed in Zimbabwe (Chipika 1998)). Governments did not invest much in pasture improvement and animal husbandry in the peasant sector. Livestock production by this sector, and especially by nomadic tribes, is mainly carried out in woodlands.

Effects on forestry resources of the agricultural policies, practices, and associated legislation adopted during the colonial period are summarized in Box 1. The colonial period has been reviewed in greater detail than the other periods because this is the

period where many of the post-independence structures in land use, and agriculture in particular were laid. The post-independence governments continued for a long time to operate with such structures and even today agriculture is still a smallholder-estate farmer affair. It is also during this period that considerable deforestation took place to give way to agriculture. For example in 1963 FAO estimates indicate that communal areas of Zimbabwe had 60% of their area under woodlands, while by 1978 (two years before independence in 1980), this area had been reduced to 30% (Bradely and Dewees 1993).

It is therefore important to understand what factors shaped or continue to shape events in agriculture and the eventual impact on forestry. A lot of what is happening today has its roots in the past. "An object is as far behind the mirror as it is in front" (Anon.)

Box 1. Some effects of colonial agricultural policies, practices, and associated legislation on forestry resources

- 1. Commercial/estate farmers drew land from forests because of extensive nature of plantation/estate agriculture.
- 2. The lack of complete property rights on the land could have been a disincentive to the adoption of land conservation measures.
- 3. The low prices of agricultural products to smallholders as well as restricted access to markets, credit and extension services did not promote an increase in marketed surplus. To the contrary non-farm activities and off farm employment was promoted as alternative sources of income, thereby reducing labour available for crop production and possibly constraining deforestation. However, some of these activities were conducted in the forests, resulting into deforestation and forest quality deterioration. Further, with low incomes, investments in agriculture were negligible, leading to land exhaustion and need for 'new' land which was excised from forested areas.
- 4. The forced labour and migratory labour meant that family agriculture was essentially left to women. The reduced availability of men labour for land clearing meant overuse of land without fertility recovery with consequent yield decline and land degradation, and therefore need for 'new' land mainly from forested areas. However, reduced availability of male labour could have constrained opening up of new agricultural land, thereby reducing the pace of deforestation.
- 5. Geographical differentiation of economic activities resulted into imbalanced growth or development in each of these countries, with some areas more adversely affected by environmental problems than others. For example, in Mozambique the southern provinces became a supply of migrant labour to South Africa, while the central provinces were dominated by plantation agriculture. The northern provinces saw little colonial economic development.
- 6. Although the distortion policy measures satisfied the short-term interests of the colonial governments, they left serious structural problems, which were eventually inherited by national governments at independence. These included weaknesses in land tenure and legislation, unequal regional development pattern, controlled pricing and marketing of agricultural products, and lack of skilled manpower. Many of these imbalances have yet to be addressed fully in the individual countries, and yet they are the final determinants of success in sustained natural resource use and management in these countries.
- 7. The colonial governments did not put into place policies and strategies to internalise the negative externalities arising from land use policies and practices in agriculture.
- 8. In this period the framework was established for almost all-environmental problems these countries faced and continue to experience. Effectively the colonial administration laid the foundation on whether or not forestry and natural resource in general, could be managed and used sustainably.

4. POST-INDEPENDENCE DEVELOPMENTS

In this period some of the agricultural structures built up during the colonial period remained intact to the present day. The pattern of agricultural production continued to be polarized: smallholder and estate/cooperative/commercial farmers. Changes in agricultural production were realized through relocation of people and using economic incentives.

The post-independence period is characterised by two distinct economic regimes in all these countries. The early post-independence period witnessed good economic growth in each of these countries, although this was short lived in Mozambigue as the country was plunged into civil war. The countries experimented with economic and political policies to speed up economic development. This period was characterised by economies that were centrally planned, with state ownership and/or control of most means of production and distribution. The role of market forces in allocating resources was very much constrained. With the exception of Malawi, the other countries had socialist oriented policies, ranging from a Marxist-Lenin government in Mozambique to home-grown brand of socialism in Tanzania called 'Ujamaa'. These experiments, combined with unfavourable regional and global events like the oil crisis of the early 1970s, eventually stifled economic growth, and forced the governments to adopt economic reforms backed by international financial institutions, commonly known as structural adjustment programmes (SAPs). They started to be implemented in Malawi, Tanzania, Mozambique and Zimbabwe in respectively 1980, 1986, 1987 and 1991. These reforms are on going. SAPs place emphasis on a number of things including increased private sector involvement in the national economy, trade liberalisation, reduction in budget deficit through fiscal retrenchment and domestic credit contraction, and substantial currency devaluation. These policies demanded major re-orientations in the environment in which economic activities are operated. The countries gradually shifted from the pre-SAP centrally planned economies to decentralised economies that were increasingly becoming market oriented.

4.1 Pre-SAP Period

During this period many of the colonial policies and practices remained in place (Box 2). However, there were some significant changes in policies and strategies for rural development, which affected the sector and eventually forest cover. A notable one was the increased state intervention in production, processing, marketing and pricing. This saw the emergence of parastatal organisations to implement these state functions. There was a deliberate effort by governments to increase agricultural production. This was notable in Zimbabwe, up to mid-1980s when agriculture flourished. The land area under maize, sorghum, soya bean groundnuts, cotton, sunflower and burley tobacco in communal and resettlement areas expanded by about 12.3% in this period (Chipika and Kowero 2000). In Tanzania the production of staples, namely maize, paddy and wheat between 1975/76-1976/77 and 1984/85-1985/86 increased by respectively 38%, 48%, and 18% (Bagachwa et al . 1995). The extent to which increased crop production drew land from forests and grazing land is not known.

Another feature of the period was the continued concentration of smallholders to confined land areas although the objectives and patterns for such concentration changed. In Tanzania, the 'ujamaa' policy introduced a villagisation programme that saw massive

Box 2. Some notable pre-SAP period policies and practices

- 1. Continued ownership of land by state, only changing hands from colonial governments to national governments. In Tanzania and Mozambique, the private commercial farms were nationalised and transformed into state farms, and communal villages were established as a basis for the transformation of the smallholder sector.
- 2. Absence of a comprehensive agricultural policy in each of the countries for practically all this period. The sector was driven by a number of policy statements and strategies which were part of larger programmes known by various names like rural development plans, integrated rural development programmes, five year development plans, etc. Otherwise they were part of major political pronouncements, like the development strategy for Mozambique that was formulated in the third FRELIMO party congress of 1977 (FRELIMO, 1977). The sector continued with a top-down approach to its development.
- 3. Government intervention in pricing and marketing (through price controls and state run marketing institutions) had negative effects on agricultural production in Mozambique and Tanzania.
- 4. Estate and smallholder agriculture continued to characterise the sector, with increased support from governments going to the former.
- 5. The main agricultural strategy mostly remained unchanged, with the estate farmers largely producing for both domestic and export markets, while smallhoders produced mainly for subsistence and domestic market. The latter saw increased production through agricultural extensification while the estate sector realized good productivity growth through agricultural intensification.
- 6. Continued institutional, technological, and pricing differentials between estate sub-sector, state monopolies, and cooperatives on one hand, and smallholders on the other. This discouraged the latter from making any meaningful investments in agriculture, encouraging peasants to continue to mine the land and the few forests and trees left.

movement of people into communal villages. The same was true for Mozambique with the creation of communal villages. Cooperative production in these villages was seen as the viable means of transforming the peasant sector into a modern sector (Abrahamsson and Nilsson 1994; Branco 1994).

In Zimbabwe, movement of people into the communal and resettlement areas continued. In Malawi, due to growth of the estate sub-sector, smallholders lost their customary lands and remained on limited land. In the late 1960s and early 1970s the thrust in Malawi was for politicians, top civil servants, and the government parastatal, Agricultural Development and Marketing Corporation (ADMARC) to go into estate farming and supported with credit from state owned banks (Kachule et al. 1999).

This reversed the colonial policy, which transferred the estates to customary land. Estate farming therefore necessitated clearing customary land under forests, and effectively started to mount land pressure on the smallholder farmers whose customary land was taken away. The war in Mozambique created concentrations of refugees in confined and secure areas within the country as well as in neighbouring countries. The extent of forest cover clearing to give way to habitation, farms and other infrastructure associated with these massive movements of people in the region has never been assessed. One notable aspect is that during the colonial time people were confined to specific areas, and this trend was entrenched during the independence era. A lot of forest clearing was done in both periods, largely because of this. It is most likely that massive deforestation took place in these countries before the onset of the economic reforms. For example, Bradley and Dewees (1993) and Dewees (1994) report that woodland cover in the communal areas of Zimbabwe had been reduced to 30% by 1978.

This fixity of smallholders and with very little room to manoeuvre in terms of land accessibility not only increased clearing of forests and indigenous trees on farms but also degraded their land because they invested very little in improving land and agriculture. It is within such a confined environment that smallholders continue to live and are expected to respond to various policies, macro-economic and otherwise, to improve their agriculture while simultaneously conserving natural resources. And this is the framework on which the SAPs have to operate successfully.

4.2 The SAP Period

This period stretches from when individual countries started to implement the economic reforms to present time (2002). These reforms have intermittently been in force in all these countries, albeit at different degrees of enforcement. They were introduced in Tanzania in 1986/87 (after a brief spell in 1985/86 with home grown reforms), Malawi in 1980, Mozambique in 1987 and Zimbabwe in 1991.

The SAPs employ most of the policies discussed in section 2. The implication of the SAPs on agricultural land expansion varies. The SAPs targeted increasing export crops through price and market liberalisation and currency devaluation. There was less emphasis given to production of food crops. Changes in area allocated to different crops in the different countries are presented in Table 1. In all the four countries there was a mixture of a decline or modest increase in the production of the staples. As regards production of cash crops which were essentially for export, the performance was much better in all countries implying that the farmers' response to the SAP policies was positive for these crops.

In Mozambique, it is estimated that the annual growth rate in agricultural production between 1992 and 1997 was 6.3% while marketed surplus through formal markets grew at the annual rate of 34% (MAP 1998). Within the smallholder sub sector, significant changes have taken place in land allocation with large increases in areas for tobacco and sunflower. The period selected (1994-2000) coincides with social and political stability in the country. However, due to earlier effects of the war cropland area declined dramatically.

In Malawi, the thrust for estate agriculture increased, with land under estates increasing from 759,400 hectares (6.4% of total land area) between 1980 and 1989 to 1,148,000 hectares (9.6% of total land area) between 1990 and 1993 (Kachule et al. 1999). This represented the best land and was taken from customary land, involving clearing of large areas under indigenous forests. Further, the government promoted a 'project approach' to smallholder farming, in that it launched four Integrated Rural Development Programmes (IRDP) after independence, the failure of which was followed by a National Rural Development Programme (NRDP) which divided the country into eight Agricultural Development Divisions (ADDs). The failure of both IRDPs and NRDP

meant that the government was unable to increase smallhoder farm productivity. Further, the government was unwilling to raise prices paid to smallholders for export crops and could not solve the problem of peak labour demand for smallholders during cropping seasons. Low agricultural productivity and producer prices combined with decline in average farm size led to decline in real incomes for rural families. As coping measures, rural families resorted to massive deforestation of indigenous forests as sources of income through sale of firewood, charcoal, timber and other forest products (ibid.).

	Tanzania (1986/87 -	Malawi ^b	Zimbabwe	Mozambique
	1991/2) ^a	1989-1992	(1991-1995) ^c	1994-2000 ^d
Cash Crops			-	-
Coffee	4.8	-4.13	-	-
Tea 53.2	1.25	-	-	
Tobacco	7	33.89	55.42	536.0
Cotton	16.2	18.08	-0.09	3.1
Staple Crops	1986/87 - 1993/94	1989-1992	1991-1995	1994-2000
Maize	2.8	7.11	30.56	227.0
Paddy	1.2	-40.19	-	-38.3
Cassava	0.8	-13.85	-	-19.0
Sorghum	-	-7.81	19.81	-31.4
Soya beans	-	92.46	-66.67	-
Ground nuts	-	-116.6	-21.05	78.5
Sunflower	-	51.02	-5.71	660.2

Table 1. Percentage change in land area for different crops

^a Msambichaka and Naho 1995.

^b Smallholder hectarage between 1989 and 1992. Source: Famine Early Warning System (FEWS) Malawi.

^c Chipika and Kowero 2000.

^d Computed from Instituto Nacional de Estatística 2001, Ministerio da MAP 1994. The data only represent the household sub-sector.

This period is characterised by rapid erosion of some previous agricultural related policies and legislation. These included a gradual to complete elimination of subsidies on agricultural inputs; increasing role of private sector in agricultural production, distribution of inputs, and marketing of agricultural output; and increasing role of the marketing forces in pricing of agricultural inputs and outputs. This paper does not intend to review in detail the effects on forestry of SAP policies on agricultural production. However, the noted agricultural land expansion (which could be attributed to these policies), if allowed to continue could have disastrous effects on the remaining public woodlands and those forests not under effective government control in these countries.

The same could be true of the resettlement and commercial farms of Zimbabwe because these areas have significant woodland cover and response to these policies could result into clearing of woodlands. For example, in a study undertaken in Tanzania Apparently the road constrains expanding this maize farm into the woodlands, but for how long? (Photo: G. Kowero)

by Monela et al. (2000), about 45%, 44%, and 32% of farm land was acquired by clearing public woodlands and from open public land in intermediate, remote, and peri-urban sites respectively. In Malawi, opening up of gardens in natural forests constituted 21% of farmers' explanation on environmental degradation (Minde et al . 2000). This shows that some of the remaining natural forests are still accessible, albeit illegally, to farmers.

The implications of the individual SAP policies on agriculture and eventually on forest cover in this region have not been sufficiently studied and therefore need further scrutiny. However, the potential of these policies to increase land under agricultural crops in this region has been demonstrated in various studies including Bagachwa et al. (1995), Chipika and Kowero (2000), Minde et al. (1997), and Reed (1996). Expansion of cropped area and livestock grazing remain the major sources of deforestation and degradation of miombo woodlands.

5. OVERALL IMPLICATIONS FOR FORESTRY DEVELOPMENT

5.1 Pre-colonial period

There was very limited degradation of land and forest resources during this time, due to low human and domestic animal populations. Customary rules and indigenous knowledge guided the use of natural forest resources.

5.2 Colonial period

 Boundaries were put between some natural forest resources and agricultural land thereby restricting shifting cultivation. The boundaries or restrictions were in form of rights of access to natural forest resources. In order to contain