CRISIS IN COLONIAL AGRICULTURE: SOIL EROSION IN TANGANYIKA DURING THE INTERWAR PERIOD

BONAVENTURE SWAI*

Initially a 'blessed word', the term development has given way to pessimism. If those who introduced the designation expected to solve the problem of poverty with the stroke of a pen, this has not occurred. Intellectualizing upon Third World ills still goes on.[1] Thus has been posed the question: 'Development for what?' Thus, too, the ideology of 'small is beautiful' has gained currency.[2]

Radicals have counteracted the notion of development to show its ideological overtones. Those enamoured with the scientific method have attempted to reveal its historical and social content, and sought to offer an alternative with which to comprehend the historical process.[3]

Yet the notion of development is not a postcolonial invention. Rather it is an inheritance from the colonial past.[4] Within the British Colonial Empire, the 'development fever' became a dominant theme of imperial ideology in the aftermath of the First World War. There was a need, it was declared to bring 'the social and political life of colonial territories... into a healthy relation with the more advanced countries', and that this 'is a task which demands careful and deliberate planning'. Such 'colonial management' or 'social engineering', it has been asserted, was governmental action 'designed to secure, maintain, or restore the good life'.[6] To ensure that this ambition was fulfilled, two Acts of the British Parliament (the Colonial Development Act, 1929, and the Colonial Development and Welfare Act, 1940), were passed to create a fund which would enable the Imperial Government to advance loans and grants to the colonies in areas considered complementary to the British economy. The Development and Welfare Act was 'designed to expand greatly the scope of the Act of 1929', and had a fund of £5 million as compared with £1 million for the previous Acts, in addition to a sum of £500,000, which was raised to £1 million in 1945, for agricultural research in the colonies.[7] 'Planning', the leading English historian A.J.P. Taylor has said, 'was the key word of the thirties: planned economy, plan for peace, planned families, plan for holidays'.[8] And this was not restricted to the colonial empire alone. On the contrary, it involved to an even greater degree, perhaps, the metropolitan economy. Under the whip of monopoly capitalism, it has now come to be realized, the state was becoming more and more interventionist.[9]

*Associate Professor, Dept. of History, University of Dar es Salaam.

Much faith was put on science in the effort to commercialize larger areas of colonial agriculture.[10] In this, the notions of progress and development had one thing in common, which is that nature was inexhaustible.[11] But Marx has warned:

> In our days everything seems pregnant with its contrary. Machinery, gifted with wonderful power of shortening and fructifying human labour, we behold starving and overworking it. The new fangled sources of wealth, by some strange weird spell, are turned into sources of want. The victories of art seem brought by the loss of character. At the same pace that mankind masters nature, man seems to become enslaved to other men or to his own infamy. Even the pure light of science seems unable to shine but on the dark background of ignorance. All our invention and progress seem to result in endowing material forces with intellectual life, and in stultifying human life into material force.(12)

Colonial management was realized at a great moral and material cost, and the successes scored were promptly nullified by the negative consequences brought about. Thus the earth began to protest to imperial proconsuls: 'You are consuming my body'.[13]

Colonial development brought about acute conditions of soil erosion. Conventional wisdom has explained these as being above politics, society and classes. In so doing it has been assumed that 'the bougeois class and capitalism are not to blame for their emergence'.[14] Instead, the colonial peoples have been blamed for ruining their own environment because of their so-called backward and unscientific methods of cultivation. Soil conservation measures have therefore been viewed as part of the imperialist humanitarian endeavour to teach the 'natives' better methods of cultivation. But in the name of Christianity, during the mercantalist era, Africa was raped, plundered and robbed of its resources. The hearts of those who engaged in this process of primitive accumulation, though, was in their 'cash box' rather than Christ. Then this changed to the quest for 'free trade' in the epoch of free trade imperialism. But if whisky and rum had been exchanged for slaves during the mercantalist era, now the same merchandise was offered with a view to obtaining ivory, gold, palm oil, and so forth. And in the epoch of monopoly capital the search for a cheap source of raw materials and protected markets led to the partition of Africa. All this was fulfilled in the name of humanitarianism. This time the African had to be protected in his own habitat. To lend more credence to this, conferences to protect African fauna were held and associations for protection were formed.[15] There was, nonetheless, every reason to be concerned about African fauna because by the 1880s

'from 60,000 to 70,000 elephants a year were being killed to meet the demand of the European market'.[16] That African elephants were not inexhaustible was becoming clearer.

All techniques of development, Meillassoux has warned, 'are no more than techniques of exploitation designed to expropriate wealth'.[17] So was it with the soil conservation measures which were introduced in Tanganyika in the interwar years, and which became more vigorous in the aftermath of World War II. Peasants have been blamed for ecological crises, either because they breed too much and too quickly and so cause overpopulation, or that their agricultural systems are too primitive and careless to take consideration of eventualities. However, particular relations of man to nature are determined by the 'form of society and vice versa'.[18] This is particularly the case with a colonial social formation which is 'an economy of despoilation, on the one hand exhausting the soil and raw materials and on the other, over-exploiting the rural population'.[19] This essay aims to analyze the crisis of soil erosion in Tanganyika in the interwar years. The crisis occurred at the same time as the series of 'campaigns to grow more crops' with a view to softening the dire effects of the economic crisis which dominated the imperialist world subsequent to World War I, especially the Great Depression of 1929-36. But if erosion was taken seriously during these years, it cannot be explained solely in terms of the economic activities of the period.[20] Nor can the ecological crisis be explained by the colonial desire to raise colonial surplus alone, although (obviously) this was uppermost in the minds of those imperial proconsuls concerned with colonial management. 'A scientific analysis of competition', said Marx, 'is not possible, before we have a conception of the inner nature of capital, just as the apparent motions of the heavenly bodies are not intelligible to any but him, who is acquainted with their real motions, motions which are not directly perceptible by the senses'.[22] In this regard, the nature of capital in backward social formations is equally important. To be sure, it is at times of crisis that the contradictions most dominant in a given social formation reveal themselves most clearly.[23] But as Marx once noted while criticizing an economist, the sagacity of descriptive and empiricist studies which 'consists in observing the clouds of dust on the surface and presumptuously declaring this dust to be something mysterious and important' should not be confused with the actual social relations from which such conditions emanate.[24]

This essay is divided into two. The first part seeks to delineate the crisis of soil erosion within the British colonial empire, particularly

Africa. This part is intended to provide a wider context within which to view the erosion crisis in Tanganyika. The latter is in turn undertaken in the second part of the essay. The study of the relation between man and nature is today being taken more seriously than ever before. This is clear from the various preambles adopted by social scientists, and lately by historians in some of their conferences.[25] But in quite a number of the studies which have been undertaken, Sir Arnold Toynbee's notion of 'Challenge and Response' continues to be dominant.[26] This essay is designed to offer an alternative approach which, it is hoped, will be more realistic. It also needs to be pointed out that this study, unlike what professional historians would maintain, has not been undertaken with a view to investigating the past for its own sake. Only recently, the President of Tanzania, Mwalimu Nyerere, while on a tour of Mwanza Region in the North Western part of the country observed: 'If we do not look out, in twenty years Sukumaland can turn into a desert'.[27] In 1931 the Director of Veterinary Services in British Tanganyika had warned 'the first meeting of the Standing Committee on Soil Erosion.... that overstocking would produce desert conditions in Sukumaland within twenty years'.[28] Maybe both dignitaries are wrong. The observations, however, were induced by certain environmental occurrences. Even so, statements of this kind, produced in the context of two supposedly very different social formations, colonial and postcolonial, may be useful in convincing some observers to re-examine the so-called fundamental differences between the two societies. In this regard then it becomes the more necessary to delve into the past 'because otherwise it would be impossible to understand how the present came into being and what the trends are for the near future'.[29] But it was said of the Irish question by Lord Rosebery that 'it has never passed into history, for it has never passed out of politics'.[30] Only a serious understanding of the 'scientific method' will avoid such an attitude towards the study of history.

1. The Erosion Question and the British Colonial Empire.

In the 1880s the Arabica coffee crop in colonial Ceylon failed because of soil degradation which was induced by soil erosion. Erosion which was then on the ascendance soon acquired extremely serious proportions. In no time the Ceylonese tea crop was also in danger. This entailed the introduction of soil conservation measures.[31] The plight of erosion within the British colonial empire was not restricted to Ceylon. In India the problem was soon to be reported as chronic and that only in 1930s' in China were

conditions considered more critical. Erosion in India was attributed to wanton destruction of forests. Stringent measures were introduced to control the rapid depletion of forests. Cases of 'willful destruction of this nature were to be tried in court by European magistrates' rather than the Native Judiciary which, it was feared, was ignorant of the importance of the new policy and thus 'let off delinquents with light punishment'.[32]

Environmental conditions were equally disheartening in Palestine.[33] For this reason A. Grasovsky, an official of the Palestine Forestry Service, had undertaken a world tour in 1936 and 1937 to study the plight of erosion. Out of this tour emerged a paper, 'A world tour for the study of soil erosion control methods', which was published in Oxford in 1938 as Imperial Forestry Institute Paper 14.[34] In the Dominions 'soil Drift' had reached an advanced stage in Southern Australia, and Canada as well as South Africa were not safe. The mining industry in South Africa in particular had such a strain on the forests of that area that the results were considered alarming. Much of the South Africa precious trees were being cut to supply mining props. In 1930 alone, nearly half a million tons of props were 'sacrificed in the South African gold mines'.[35]

Nevertheless, soil erosion was most serious in the United States of America.

> Calculations made in 1939 show that in the 150 years' history of the United States not less than 114 million hectares of good land had been destroyed or, at least, impoverished. Apart from this, accelerated soil erosion over an area of 313 million hectares of land removed a considerable portion of the topsoil. Degeneration affected about 600 hectares a day, or 200,000 hectares a year. Every year 2,700 million tons of solid material is removed from the fields and pastures of the United States. Even if one takes natural erosion into account, these figures strikingly show the impoverishment of soil that was almost untouched 150 years ago.(36)

More than in any other area, it seems, the 'demons in control of society in the United States: commercialism and money-making, narrow practicality, the spirit of gain, gave rise to the crude spoilation of nature, that was at times quite senseless and immeasurably cruel'.[37]

No such calculations are available for the British empire; but as has already been mentioned, the situation was equally alarming. 'During the last few years', wrote, G.V. Jacks who was then the Deputy Director of the Imperial Bureau of Soil Science at Rothamsted Experimental Station, 'the world has awakened to the dangers threatening it from soil exhaustion caused by short-sighted methods of agriculture'. Much has been written

about soil degradation, he went on to say, and in the United States steps have been taken to prevent it. However, 'in many parts of the British Empire (especially Africa) and elsewhere the economic incentives to exploit the soil remains too great to be resisted, so that a problem of great urgency awaits solution'.[38] Jacks concluded his observation by warning that while 'the cause of soil erosion is often given as the destruction of the natural vegetation which normally affords the soil adequate protection from the erosive action of rain and wind', this is only correct up to a point. This is so in that 'there is no reason why destruction of the natural vegetation, whether forest or grassland, should be necessarily harmful'.

> All agriculture involves such destruction, and it stands to reason that no permanent agriculture is possible where the soil is progressively deteriorating. The real cause of erosion is the practice of an agriculture which does not take full account of the natural limitations of the environment and causes of soil exhaustion, which is the inevitable precursor of soil erosion, even when stripped of vegetation, and the only cure for soil erosion is to utilize the land in a manner which maintains, and preferably increases, its fertility.(39)

For this reason, therefore, C.C. Watson who was writing for the United Empire: Journal of the Royal Empire Society blamed 'the present system of trade which demands more and more foodstuffs and raw materials' as the major cause 'threatening destruction to much of Africa's arable land by erosion'.[40]

> The bulk of this 'trade fodder' is not required primarily for food and clothing, nor the amenities of life, but for trade. If there is a surplus of these things beyond what can be traded for profit (not beyond what can be used for the people who need them), this surplus is burned, buried, allowed to rot or otherwise disposed of. The soil of Africa is thus being exploited for the benefit of the few and with no thought for that of the inhabitants; and a commercial hierarchy holds the reins. The average trader may not see how he can possibly be connected with soil erosion, but nevertheless he is.(41)

In this regard, therefore, Africans were being encouraged to grow more commercial crops not for their own advantage, but for the overseas market. 'He is being taught that money is more desirable than health. For this reason he is extending his cultivation of "cash crops", and is buying modern farm machinery to do so. The small patches of cultivation by which formerly he was able to hold his arable land intact are today giving place to larger and larger open spaces and thus exposing more soil to erosive

forces'.[42] For Watson, 'the native with his increasing herds of cattle is by no means the greatest danger to Africa's soil resources by erosion'. On the contrary, the explanation lies in the endeavour to commercialize agriculture.[43]

The effects of erosion were considered to be disastrous. Erosion caused by deforestation, it was argued, brought about water contamination and diseases. It was also found out that erosion was connected with 'increasing violence of thunderstorms, with their accompanying cloud bursts. From the super-heated surface of these barren areas hot air above induce electrical discharges of increasing violence, causing much damage to life and property'.[44] If then such were some of the results of erosion, questioned one soil conservation enthusiast, 'What shall it profit a country if it gained the whole world trade and lost its own soil?'[45]

The most serious consequence of erosion, however, is that it is very much related to desertification. Thus it was observed in the 1930s: 'It is said that erosion carried to its logical conclusion is desert'.[46] Given the possibility of such an adverse ecological crisis it was remarked that while imperial 'commercial desideratum' 'involves inducing the native to work a good deal harder than accords with his natural inclination', but more significantly it also 'involves, clearly, the encouragement of the adoption of modern and scientific methods of cultivation'.[47] The latter was intended to introduce methods of soil conservation. Africans, it was being said time and again in the 1930s, had to be taught not only 'how to take action against erosion but how to improve and maintain the fertility of their soil. Crop rotation, cattle manure and compost are the methods for achieving this and the African must learn to mould his present system to include them'.

Large areas of 'the Imperial domain all over the world', declared Watson, are in danger of destruction by the uncontrolled forces of erosion'. 'Every patriotic person who has thought for the Empire's future (therefore) should be interested in the problem of checking erosion and preserving the land for future generations'.[49] It was Sir Cecil Rhodes who once said that the 'Empire was a bread and butter question'. There was no other way that the metropolitan proletariat who were on many occasions on strike could be controlled save by turning them into a labour aristocracy.[51] Erosion seemed to be on the verge of destabilizing this arrangement. Thus like the empire itself, the question of soil conservation was becoming a bread and butter question. For most imperial proconsuls the matter was urgent. Small wonder then that on 20th October 1937 the committed

imperialists of the British colonies in Africa at a meeting of the Council of the Royal African Society with the President, the Earl of Athlone in the Chair, passed the following resolution:

> That this Council views with the gravest concern the widespread destruction of the African soil by erosion consequent on wasteful methods of husbandry which strike at the basis of rural economic Native Welfare, and it is of opinion that immediate steps should be taken for the adoption of a common policy and energetic measures throughout British Africa in order to put an effective check upon this growing menace to the fertility of the land and to the health of the inhabitants.(52)

Copies of this resolution were sent to Secretaries of State for Colonies and Dominions, the Royal Institution and other learned bodies, the various Empire Societies, the Press, 'and it has been communicated by the Colonial Office to the Governments of East and West African territories'.[53]

As a result of the October 1937 resolution, the December, 1937, Royal African Society dinner was devoted to the issue of soil erosion in Africa. The guest speakers who were 'distinguished masters of agriculture and forestry assembled to give their views on a particular topic at a public function'[54] included: Sir Frank Stockdale, KCMG, CBE, Agricultural Adviser to the Colonial Office; Sir Daniel Hall, KCB FRS, Chief Scientific Adviser to the Ministry of Agriculture; Professor E.P. Stebbing, Professor of Forestry at the University of Edinburgh; Professor R.S. Troup, CMG CIE FRS, Oxford University Institute of Forestry; and Sir John Russell, Director of the Rothamsted Experimental Station. The meeting was chaired by the Marquess of Dufferin and Ava, Parliamentary Under-Secretary of State. The meeting would have been chaired by the Colonial Secretary himself, Mr. Ormsby-Gore, but for the fact that he had more urgent matters of state to which to attend.

Lord Dufferin opened the gathering by noting that the meeting was of 'grave importance' to Africa and even the world as a whole in view of the 'tremendous ravages that erosion is causing all over the continent of Africa at the present moment'.[54] Every guest speaker delved upon a particular aspect of soil erosion, but the most vivid portrayal of erosion in Africa was given by Sir Frank Stockdale. Stockdale had just returned from East Africa and had submitted his 'Report on a visit to East Africa 1937' to the Colonial Office.[55] Hence if his knowledge of agricultural conditions in Africa as a whole might have on this occasion been second-hand, his memory of East Africa was still fresh in his mind. However, starting with Basutoland it was observed that 'the people have left the plains and taken to the

hills which they are devastating'. Thus in 1935, and with aid from the Colonial Development Fund, a Ten Year Plan to deal with the problem was devised.[56] In 'Northern Rhodesia primitive people have taken to the plough; elsewhere stock are the main concern and so on'.[57] In the latter country, therefore, it was remarked that 'anti-soil erosion measures have to be taken and rational grazing evolved.'[58] In Nyasaland the situation was not any better.[59] In Northern Nigeria, though, the state of soil conservation was heartening 'because it is here that the Agricultural Service realized from the outset that if one introduced ploughs to African cultivators or farmers, it was necessary at the same time to introduce them to the use of farmyard manure and to establish what has become throughout the Colonial Empire as Mixed Farming'.[60]

If soil conservation in 1930s Northern Nigeria was remarkable, that was not so with East Africa. In Tanganyika, Stockdale said, much useful work has been done: 'practically all hill tribes have regulations for the control of erosion'.[7] But Stockdale also warned that this was only one aspect of the picture. He therefore went on to say:

> I do not wish you, however, to gather that the conditions in Tanganyika are satisfactory in all areas. Most certainly not. One can go to Central Tanganyika. I remember a picture of certain districts through which I travelled where conditions are appalling, and the only thing that can be done is to abandon any effort to try to win back the country. It would cost far too much and it would be far better.... to move the people into areas where they have better prospects of success, and in doing so to see that they adopt methods of agriculture which are suited to the district and which provide against erosion.

In Kenya some areas had been equally devastated. Here there were certain areas which were 'distressing as far as soil conditions are concerned. In several the state is deplorable. This was particularly so with the state of affairs in Ukambani where people were 'starving by reason of erosion.[63]

Professor Stebbing portrayed an equally bleak picture for not only Africa but also the whole of the empire. Although he agreed with Stockdale that some kind of research had already been undertaken in certain colonies on this issue, he also warned:

> It would appear that in some regions erosion has reached such a point that some of the elementary methods to stem it should be brought into force under Government orders without awaiting the results of research work. The latter will, in due course, tell us a good deal more about water levels, depreciation in soil values, and intermittent rainfall than we know now.(64)

Meanwhile, urged the Professor of Forestry at Edinburgh University, 'check the danger at the fountain head by cheap measures such as the regulations of the farming, prohibition of firing the countryside except by the local authority, and conservation and production of all important forest areas'.[65] The colonial governments, Stebbing went on to say, had to be involved in such a venture fully. This had to be so because 'soil erosion is but a fraction of the whole agricultural question; the distinctive feature in evolving a better agriculture is the idea of bringing everybody from the Governor downwards to bear on it; and it has to be realized that the basic problem of Africa is a better agriculture. For practical purposes the unit is the district and the officer in charge of it should be regarded as the estate agent, with technical officers to assist him with the work'.[66] The Department of Agriculture had to work hand in glove with Native Authorities to ensure that soil conservation measures were carried out. For Tanganyika, there was the Native Authorities Ordinance 'to make Orders (Section 9), and Rules (Section 16) for "the peace, good order and welfare of the natives"'. The original powers to make orders was, in the agricultural field, restricted to protection of trees, grasslands, and the control and eradication of animal and human disease, of tsetse and food production'. The powers were augmented from the 1930s when Specific Orders were issued by the Governor.[67] The colonial state was armed with all kinds of interventionist powers to ensure the intensification of peasant production.[68]

In Colonial Tanganyika soil conservation had to be carried out by using contour ridging or 'tuta system', 'rational methods of grazing', afforestation, and strict control of bush fires. In implementing this, imperialist ideology had it that it was intended to improve the lives of colonial peoples. But stiff resistance was staged by the so-called natives against what were termed methods of agricultural improvement. Thus when colonial officials shouted that every peasant must adopt the tuta system, the colonial peoples replied 'Matuta mali ya serekali'.[69]

2. Erosion in Tanganyika

It has been said that the interwar years in Tanganyika were a period of colonial crisis. The aftermath of the First World War, the Great Depression, and World War II forced Britain to 'exploit the empire in a manner which some realized must make its eventual loss inevitable! Draconian rules were introduced for the sake of the so-called 'agricultural improvement'. But as each 'investment brought a smaller reward' or diminishing returns, the colonial hierarchy became even more oppressive.

Oppression alienated many among the colonial people: the initiative of imperial authority was being snatched away from British imperial proconsuls.[70]

More so however, was the crisis which engulfed colonial agriculture in the interwar years. This was shown most vividly in the erosion problem which was becoming critical by the time the Second World War broke out. Erosion had been noticed even in the German times, especially in such areas as Uluguru where, allegedly, there was overpopulation.[71] But by the 1920s when British agricultural experts were developing 'systematic extension techniques' and emphasizing the virtues of mixed farming, obsession with soil erosion together with measures to curb it was on the increase. 'Erosion first attracted official attention in Shinyanga in 1924. Cameron saw the danger in 1929 and the Colonial Office in 1930'.[72] Thus was formed the Standing Committee on Soil Erosion in 1931 to discuss the problem.[73] A review of the erosion position in 1937 showed that soil erosion was widespread on cultivated land which, however, then occupied only about one-thirtienth of the territory! Areas most affected were the Central, Lake, Northern and Tanga Provinces. In Singida, a district of Central Province, erosion was particularly acute and 'damage had gone as far as to be practically irreparable.'[74]

Nortwithstanding the seriousness of erosion in Tanganyika, however, it has been argued that the Great Depression interfered immensely with efforts to curb it. The Standing Committee on Soil Erosion which met again in February 1932 was adjourned for nearly six years. The Director of Agriculture warned that reclamation measures were costly, and this was a time when all government departments had been ordered to reduce their staff due to dire economic conditions. 'Too much engrossment with the subject of soil erosion', the Director of Veterinary Services warned, 'is liable to upset mental balance'.[75] Moreover, the government was more concerned with the 'grow more crops campaign' to increase government revenue and help the imperial power, Britain, to wriggle out of the economic doldrums it was then engulfed.[76] However, conservation conscious officials like Gillman called the campaign 'destroy your Land Policy', and vehemently blamed it for obscuring the erosion problem.[77]

Nevertheless, if there was no all-territorial policy to tackle the erosion problem in the 1930s, this did not imply lack of such policy in all districts in Tanganyika. Indeed agricultural staff had been withdrawn from the more backward areas, especially the districts of Southern

Province, and transferred to areas where commercial agriculture had obtained like Northern Province. But during this very period, research stations were established at Mpwapwa in Central Province, and Lyamungu in Northern Province to deal with soil erosion in those areas among other things.[78] Concerted efforts were made by the provincial administration in Dodoma and Kilimanjaro to combat the menace of erosion in the two areas. An integrated all-territorial policy to curb soil erosion came in the aftermath of the Second World War. An agricultural centre for this kind of work was established at Tengeru, near Arusha, in 1948.[79] But a good deal of work was done in the 1930s at the provincial, and even more so district level, to curb erosion in the Central and Northern Provinces, notwithstanding the big demand put on the energy of agricultural staff by the 'grow more crops campaign'.[80]

(a) Central Province

A semi-arid region inhabited by a semi-pastoral people, the Central Province has leached and sandy soils which in the 1930s were showing marked signs of degradation accompanied by decrease in crop yields in areas under cultivation.[81] Rainfall is seasonal, but scanty and erratic.[82] Such harsh environmental conditions had induced the introduction of pastoralism on the plains, and the cultivation of crops in river valleys. The latter was interspersed with a period when the ground was allowed to lie fallow after every five years or so. Pastoralism was of particular importance during years of scarcity when rains and crops failed. Then cattle became not only the major source of food, but also the main method of storing wealth ready for multiplication in years of plenty.[83]

Such is the ecosystem extant on the onslaught of colonial rule. Not much had been done to remedy the situation in Dodoma during the German period. As for the British era, however, a bit more is known. Administration pressure was brought upon the Wagogo, Warangi, Nyaturu and Irangi to adopt commodity production to enable them, amongst other things, to obtain cash for paying hut tax which was crucial for the survival of the colonial state. Initially, it has been assumed that the inhabitants of Central Province would sell their cattle to enable them to meet this kind of colonial obligation. To these people, however, cattle were their means of production. Cattle were also central for their survival especially in times of drought which in Central Province were frequent.[84] The people of Central Province, therefore, were not prepared to sell their cattle as freely as the colonial administration would have wished. Thus the

Wagogo and their neighbouring ethnic communities were forced to adopt agriculture more intensively than was warranted by the environment and the prevalent technology.

An experimental station was started in Singida in the 1920s with a view to providing better methods of cultivation in Central Province. It was reported to the Chief Secretary in 1927 by one colonial official that the people of Singida were 'agriculturists only in a small scale, and chiefly cattle-rearing. Crops have been planted insufficiently, chiefly, I think through indolence'. As for the 1920s, 'increased planting is wanted and improved kinds of crops, particularly crops of early maturity' introduced; 'in conjunction with this, increased efforts for vermin destruction' were necessary to ensure that what was sowed would be reaped.[85] In Singida experimental station, such crops as maize, beans and millets 'which are successfully grown in South Africa under similar climatic conditions were introduced for experimentation, and these, as was anticipated, have been successful'.[86] Rice cultivation was encouraged in floodlands, 'and on those soils which, owing to poor drainage, the moisture is retained close to the surface long after the close of the rainy season'. Cassava was introduced from Dar es Salaam and its cultivation was indicating some success. So too was sorghum, mtama.[87] More experimental work was conducted at the Singida station in the late 1920s, and by then colonial officials were coming to the conclusion that what was then needed was 'to spread amongst the people the results obtained, by multiplication of seed for distribution to growers and propaganda for increased planting of food crops'.[88] In this regard the colonial administration in conjunction with the so-called Native Councils were considered crucial if the venture were to succeed.

The Nyaturu Native Authority was very enthusiastic about the idea of intensifying agricultural activities in Singida. A farm for distributing improved seeds and plants, 'especially a quick ripening type of muhogo, and the Sudan or iturika millet' was established by the Native Council.[89] The Nyaturu Chief Mgeni by his 'galvanic energy' spurred many of his subjects not only to adopt the new methods of farming, but also 'to great communal tasks in road making, tsetse fly clearing, etc, which few other tribes could be prevailed upon to tackle'.[90] Not all districts in Central Province were as successful in this venture like Singida, but the colonial administration tried its best to ensure that some of the new methods of farming and the new variety of seeds were adopted.

Prejudice against pastoralism, it has been said, also had something to do with the manner in which modern agriculture was introduced in

Central Province.[91] Indeed many imperial pronouncements emphasized crop husbandry rather than pastoralism. Thus Lord Olivier said: 'Agriculture is the paramount industry of our tropical and sub-tropical colonies. Englishmen are now attempting in Africa what they undertook in the 17th century in the West Indies, namely as planters and farmers, to establish communities maintaining a European civilization upon the basis of Negro labour'. But while it was so with the West Indies, Lord Olivier cautioned: 'European agriculture is a highly developed art, greatly superior in its total efficiency to that of African negroid communities. It is superior in its primary dealing with the soil, in regard to access, fencing, drainage and tillage, for which it is better equipped with tools and machinery'. African agriculture in Tanganyika, however, was 'higgledy - piggledy' and thus had to be controlled firmly by the colonial administration if it were to be modernized.[92] But if African agriculture had to be improved, it was sedentary farming which was favoured. If mixed farming could be practised, so much the better. In this regard, therefore, pastoralism practised in its apparent wanton manner was out of the question. Thus in his An Agricultural Testament published in the interwar years, S. Howard asserted: 'Mixed Agriculture is the rule, plants are always found with animals'.[93] Moreover:

> Mother Earth never attempts to farm without livestock: she always raises mixed crops; great pains are taken to preserve the soil and to prevent erosion: the mixed vegetable and animal wastes are converted into humus; there is no waste; the process of growth and the process of decay balance one another; ample provision is made to maintain large reserves of fertility; the greatest care is taken to store rainfall; both plants and animals are left to protect themselves against disease.(94)

Such was the agricultural ideology on the ascendance in the interwar years. In such a situation, pastoralism per se was discouraged where possible.

Soil fertility and, by implication, soil conservation were encouraged a great deal in the interwar period to ensure increased production without which, it was believed, the economic effects of the Great Depression could not be solved. For this reason, mixed farming rather than pastoralism was emphasized with a view to making peasants use animal manure in their fields. Such a policy was also encouraged in the Central Province, especially with regard to the cultivation of groundnuts, simsim, and sunflower.

The position of agriculture in the Central Province was compounded by a number of natural calamities. The frequency of famines was one such calamity. Usually attributed to the recurrence of drought, this calamity was augmented by such occurrences as the locust invasion of 1928-1933 which consumed food crops and pasture, and thus intensifying the suffering of man and beast to a degree hitherto unparalleled in the history of Central Province.[95] Famines forced the colonial state to goad the people to adopt sedentary agriculture more than ever before. In a social formation in which those who labour had to take charge of their own reproduction and reconstitution, on top of producing enough surplus labour, but where, all the same, such conditions did not permit, the colonial state adopted whatever policies considered necessary to ensure that this happened. The colonial state, it has been said, laid the conditions necessary for the super-exploitation of colonial labour. In this regard, Central Province was no exception.[96]

Added to this was the tsetse menace which following the adverse effects of the First World War in Central Province recrudesced to a degree hitherto unknown.[97] Thus it was calculated that a quarter of Central Province's 37,000 square miles was infested with the dreaded tsetse in 1936.[98] In Singida it was reported that the tsetse 'which press in all sides' was forcing the inhabitants of the district to take to the hills. Here the dreaded fly occupied half of the district. Kondoa was not safe either. And in areas occupied by the tsetse, neither people nor stock were safe.[99]

In view of these calamities: famine, locusts, drought and the tsetse, the peasants of Central Province were urged to grow 'muhogo and sweet potatoes in every damp mbuga'.[100] In 1931 the Provincial Commissioner reported to the Chief Secretary:

> The year has been a perplexing one to the Native Authorities in every way. In so many cases our advice and instructions have verged on the contradictory. They must accept lower prices for their produce because local prices depend on World prices which are low. They must conserve food. They must plant muhogo, sweet potatoes and other root crops to defeat locusts. They must grow for export. They must sell some of their cattle to raise tax and reduce the great surplus of stock They must not permit movement of cattle because of rinderpest. They must cultivate as before. They must not destroy forest growth or cause soil erosion.(101)

Such were the contradictions in policy brought about by the natural calamities coupled with the nature of the social formation which was but a backward capitalist economy.[102]

The place of Central Province as an appendage of the capitalist economy, in this particular case under the command of the British, entailed that it has to produce for export. Yet the frequency of famines entailed that more attention, that was warranted in relatively fertile areas like Kilimanjaro, had to be paid to the subsistence sector. But the tsetse menace was making more and more areas uninhabitable for both man and beast. The reduction of arable land led to overcrowding. The cultivation of land which was extremely poor for the purpose of farming caused erosion. The former acted as a catalyst to the latter. Thus by 1938 the Provincial Commissioner reported to the Chief Secretary: 'There is scarcely an area in the whole of the province which is free from the menace of soil erosion in one or another of its forms, and while the position is partly due to disafforestation and wasteful methods of agriculture, its main cause is overgrazing'. Erosion was very noticeable near water-holes. The endeavour to supply more of these, however, did not solve the crisis.[103]

How the Provincial Commissioner concluded that overgrazing was the major cause is in question. What is clear is that cattle and agriculturists were competing for land. Why cattle were blamed can only be explained by the so-called prejudice against pastoralists. It is also a pointer to the manner in which the provincial administration wanted to solve the problem, that is mainly by destocking. More desperate reports followed. 'Soil-erosion', the Provincial Commissioner reported in 1942, 'threatens the land and thus constitutes a menace to human and animal health and to agriculture, animal husbandry and communications - a menace that brings in its train the danger of recurring or increased famine'.[104] Thus in 1943 there was a continued drive to grow more crops, and shirkers were brought to book.[105]

Erosion, it seemed, was also contributing to the frequent famines besetting Central Province.[106] 'The aridity of the Dodoma Karoo', it was noted, 'has led to famine after famine, some local, some general, for which it has only been possible to find palliatives in the form of pressing for increased acreage of food crops, especially sweet potatoes, and of intalling tribal food reserves. In the Singida and Kondoa districts, where the climate is kindlier in a slight degree, the tsetse has engulfed great areas in recent years, and forced the population back upon itself, only to be beset by erosion of the soil, insidious as in Singida or wholesale as in Kondoa! Here the population looked weak, and 'anyone who spends over two years in Ugogo should be regarded as expendable'. 'Both man and his environment must be reclaimed'.[107]

Reclamation work which was geared to land conservation had been started in the 1920s. By 1931, 'tribesmen, who have never made a "tuta" before' had 'learnt to carry out that nearly perfect but most laborious form of green manuring. And this is valuable advance as in the near future we (the colonial government) shall have to insist on contour 'tuta' culture on all fan slopes'. The contour culture on fan slopes was 'intended to link up the preservation of all timber on the steep hillsides with the steady provision of water supplies on the plains', and that if this was completed successfully the provincial administration would 'have done more than is possible in the most tribal areas to conserve moisture, prevent soil erosion, and preserve the inherent fertility of the soil'.[108] Nevertheless, the problem with the plains where water was provided and so induce people to migrate to such areas was the menace of the tsetse. Even so, in many areas of Central Province, people were encouraged to stop cultivating on the hills which were being denuded of their trees, and so 'make their homes on the fan slopes and out on the plains whenever water is available'.[109] But it was also becoming clear that many of the slopes were becoming congested, particularly in Kongwa and Mpwapwa. The alternative lay in reclaiming land infested with tsetse flies. This was done by clearing bush, a procedure which in the long run also led to erosion. The Central Province appeared to have been caught up in a vicious cycle.[110] Aside from the 'tuta system', the people of Central Province were also encouraged to sell their cattle. For those who were prepared to sell their stock, though, none could be sold during the Great Depression for want of markets. The people were, therefore, told to grow more crops 'to meet their tax obligations to the government'.[111] By the late 1930s, however, outright force was being used to make the people of Central Province part with their cattle through the marketing system. Special auctions were introduced by the government in selected areas to ensure that the cattle population in Central Province was reduced. Nevertheless, erosion was still rampant and, indeed, on the increase. Government anti-soil erosion policies appeared fruitless.

Northern Province:

The main problem facing Kilimanjaro nowadays is that of overpopulation. A similar problem is evident in some parts of Mbulu and Arusha, especially Meruland. Nor is the problem restricted to these areas alone. Similar issues are evident in Upare and Usambara which formerly constituted a significant part of Tanga Province. Yet the problem is not a recent one. This is particularly so for Kilimanjaro where a number of reports were written

during the colonial era on the issue of overcrowding on the mountain. Such were the Gillman Report, the Teale-Gillman Report, the Arusha-Moshi Lands Commission, the Wilson Report and the Elliot and Swynnerton Report.[112] The menace of soil erosion in Northern Province, and for that matter other areas of Tanganyika Territory like Ukiriguru was associated to a large degree with the issue of overcrowding. This section is restricted to erosion in Kilimanjaro during the interwar years where the menace was tackled fairly early.[113]

While erosion in Kilimanjaro was due to overcrowding, the causes of this phenomenon should be located. One of these was the alienation of land to the settler community. Thus while the population density of Kibosho, Marangu and Uru in the 1940s was 756, 547 and 495 people to the square mile respectively, the percentage of land which had been alienated in these areas was 36, 20 and 23. Unlike what is peddled around in the name of conventional wisdom, therefore, overcrowding was due to neither the benefits of 'colonial medicine' nor the capacity of Africans to breed excessively. Added to overcrowding was the rise of a class of rich peasants which drove the poor from their lands and absorbed the common land and so causing landlessness. The effects of this were shown in the increasing amount of litigation in 'native courts' on the question of land in Kilimanjaro.

Intensive cultivation both for commercial crops and food soon brought about the menace of erosion. Thus the Department of Agriculture observed in the 1930s that soil erosion in Kilimanjaro was on the increase due to uncontrolled cultivation of the land and deforestation. 'The native', it was emphasized, 'must be made to realize the danger; the Wachagga are especially jealous of their lands, they should be equally jealous of their soil-fertility of those lands which will be lost to them by erosion as surely as they could be by alienation, unless they adopt a system of intensive gardening, which on the steeper slopes of Kilimanjaro should be carried out by terraces'.[114] Rules framed under section fifteen of the Native Authorities Ordinance for the conservation of water and prevention of soil erosion were initially introduced. These were reinforced by new orders which came into force in 1932. The latter were in turn consolidated by the rules of 1934 which prohibited the planting of crops and trees within 'an area measuring 50 paces from the banks of any river or spring except with the sanction of a chief'. Coffee grown in such areas before 27 August 1931 had to be interplanted with bananas. However, coffee grown after that date had to be uprooted. The orders also had it that a plot of land owned adjacent to a river 'before 1.3.35' had to be separated from the river by 'a line of

beacons 50 paces from the river or spring. The beacons must be constructed of stone or other material accepted by an Administrative Officer or Agricultural Officer or Native Authority and each beacon must be visible to a person standing at the adjoining one'. Contravention of this order carried a fine of fifty shillings or one month imprisonment or both. Crops planted on river valleys without the sanction of a recognized authority had to be uprooted, 'and the person ordered to plant "Mfumi" or "tembo" or other approved trees in the area so uprooted'. This action, it was claimed was carried out with the intent to ensure 'conservation of water and prevention of soil erosion'.[115]

The tendency to cultivate on river valleys was caused by overcrowding. The fact that the soil conservation measures were tied to the planting of coffee, as crop which was becoming very popular in Kilimanjaro ensured that the orders would be observed to the latter, particularly by the rich peasantry. Soon, therefore, erosion was controlled in the highlands. This was so because 'the continuous orchards of bananas and coffee bounded by compact hedges and protected by shade trees and shelter belt, all tend to break the force of the rain, to slow down run-off, to reduce desiccation and to give certain measure of protection to the soil through leaf fall. Further protection is afforded by manure and interplanted crops'. Such was the result of colonial policy in 1930s Kilimanjaro.[116]

While such success was being scored in the highlands of Kilimanjaro, however, the story about the low lands of the district read differently. Also called open lands, the climate in this areas was harsh and soils poor. But notwithstanding the menace of the tsetse, overcrowding had forced many inhabitants of Kilimanjaro, the Wachagga, to migrate from the highlands to these areas.[117] Here, though, lack of water forced the newcomers to adopt intensive methods of irrigation which, albeit known and practised on the highlands, were rather wasteful on the lowlands. This coupled with the adoption of intensive methods of cultivation practised on the highlands brought about the menace of erosion.[118]

Maize, and especially onions and eleusin were cultivated on the lowlands.[119] The greatest danger to the soil on the lowlands was from the 'irrigation of the finger millet (planted after the main rains) and from irrigation of bananas and coffee' normally grown in very small acounts, 'at dry periods of the year' 'Many flood their gardens with strong and destructive flows of water', and thus intensifying the menace of erosion.[120] The wanton use of destructive methods of irrigation apart, in many areas

of the lowlands, 'the bush is cut back but, despite extensive propaganda, it is seldom stumped to permit tractor ploughing so that regeneration is rapid. After the first year or two sheet erosion in the blocks of cultivation, with its attendant gullies, becomes apparent'.[121] The alternative to this destruction of the soil was to discourage the cultivation of finger millet in the lowlands and give the area to the 'vihamba system'. This, however was bound to be a slow process. Moreover, to encourage this system was not necessarily to ensure that neither onions nor finger millet would be grown any more.[122]

Such then was the state of soil erosion in Kilimanjaro. Anti-erosion policies were more successful on the highlands. Here, 'Native Authority rules which closed the deep rivers, the smaller streams and gullies and the steep slopes to cultivation, and prescribed soil conservation measures were promulgated at an early date and were consolidated in 1940'.[123] Gangs of trained levellers lay out level contours across all annual cultivations...according to the season and supervised the construction of contour banks, with earth, trash, and stone'. Population pressure, it is claimed, had forced the colonial government to embark upon the anti-erosion campaign at such an early period.[124]

3. Conclusion:

This essay has attempted to show the antinomy of 'man and nature', and more specifically the menace of soil erosion in colonial Tanganyika. 'Man has always consumed certain natural resources which he needs. But only in recent times has it become clear that the consumption of a particular resource prompts a complex reaction in nature'.[125] Now the reality has dawned that the object of labour, nature, is limited, and that if the delicate balance between man and the environment is disturbed the results can be disastrous. Thus in 'such circumstances people inevitably become aware that a crudely utilitarian, profit-seeking, capitalist attitude to nature directly concerns the position of the mass of the people and affects their life, health, welfare and daily life, and also the physical and mental growth'.[126]

Yet the capitalist propaganda machine has tended to explain away ecological crises as if they were above the society in which they occur.[127] Such is a good display of abstracted empiricism which tends to misspecify the issue. In the case of erosion in Tanganyika, for example, it was blamed on 'native farming system' which could not cope with overpopulation and so forth.[128] This explanation has been perpetuated, albeit in a refurbished

form, and notwithstanding the changes which have occurred in the political facade. But as was indicated in the introduction, the interaction between society and nature constitutes an aspect of social practice. The 'world of nature' therefore becomes a stumping ground for not only natural scientists, but also philosophers and social scientists.[130] The environmental crisis rampant in the capitalist world economy, therefore, becomes amenable to analysis if it is remembered that the lodestar of this system is pragmatism, a philosophy which does not essentially contain a systematic view towards nature save that of utilitarianism. Pragmatism is 'the philosophy of success, the philosophy of action. It is precisely to success and action that pragmatism subordinates everything - truth, religion, matter and nature'.[131]

If this is the sort of philosophy which guided capitalist enterprise in the metropolis, it has been argued, it was worse in colonial social formations. Thus it has been said of colonial exploitation that it was rapacious 'rather than reproductive, bent on quick returns rather than long-term exchange. It was destructive of the soil and resources, yet failing to provide for alternative forms of livelihood'.[132] Colonial relations were, therefore, not just exploitative but super-exploitative. Such has also been termed parasitism or plunder.[133] Within this context have been discussed such other notions as development of underdevelopment, primitive accumulation, and lately the idea of subsumption of labour under capital.[134]

Yet what is most wanting in the attempt to apply these notions in the study of African history is periodization if reification is to be avoided.[135] Originally, primitive accumulation of capital was a process of becoming, and so too was formal subsumption of labour under capital.[136] However, for colonial and postcolonial social formations, these processes have been taking place mainly under conditions which 'already presuppose...the existence of the capitalist mode of production'.[137] This is an important observation if the continued perseverence of formal subsumption of labour under capital, the condition whereby capital subsumes the labour processes as it finds it, in given social formations is to be understood. This is so because while the phenomenon of formal subsumption of labour is insignificant in those capitalist countries which are already industrialized, 'it is nonetheless of considerable importance in the colonial and semi-colonial countries of the so-called developing world'.[138]

In African history, formal subsumption of capital under labour is thought to have began in the mercantalist era.[139] The dominant characteristic of this period, given the nature of merchant capital, was trade and

plunder.[140] Commerce was also the leit motif of free trade imperialism.[141] Raw materials for the industrial world was not yet a dominant issue. By the middle of the nineteenth century, however, the price of raw materials began to rise drastically. The inefficient methods of their production in the Americas, and the American Civil War have been cited as being some of the causes.[142] The discovery of gold in California and Australia caused a boom that helped inflate the prices of most goods, including raw materials.[143] This, coupled with the emergence of America and Germany as important industrial powers forced Britain and France to look for ways of lowering the cost of production of their industrial produce.

Initially mechanization had solved the riddle. But by this time there was a need to look for a cheaper source of raw materials as well. 'The hunt for raw materials', Mandel says, 'went hand in hand, so to speak, with imperialist capital export and was to some extent a causal determinant of it. In this way, the growth of a relative excess of capital in the metropolitan countries and the search for higher rates of profit and cheaper raw materials form an integrated complex'.[144] There was thus a 'massive penetration of capital into the production of raw materials' to force down the price of raw materials.[145] Such is what happened with the establishment of the plantation system and mining industry, both of which were geared to the export of 'migrant' labour. Such a trend had already been shown by the Dutch in Indonesia.[146]

Alternatively, peasant labour was coerced into the production of raw materials. This, the British had demonstrated with regard to India in late eighteenth century, albeit initially on a small scale, was a cheaper method than the use of slave labour. While it supplied useful cannon to the abolitionists who were against slavery in the West Indies, it was also to be the dominant trend of raw materials production in many parts of Asia and Africa.[147] This was particularly noticeable in India following the Great Rebellion of 1857, and in Africa subsequent to the partitioning of the continent.[148] Such then was the alleged imperialist endeavour 'to stimulate the lagging productivity of traditional agriculture into realizing a greater and greater share of its potential wealth, within the shortest space of time and in areas where the investment necessary to achieve this aim might be assumed of a generous as well as rapid return'.[149] Prices of raw materials began to fall in the latter part of the nineteenth century, but an upward trend again surfaced in the 1920s due to 'the stagnation of labour productivity in the dependent countries and simultaneously a rapid increase in the labour productivity of the industrialized countries'.[150]

This trend was interrupted by the Great Depression of 1929-32, but the international armaments boom and the Korean War in 1950 helped to sustain the upward trend. This phenomenon called far a quest of cheap source of raw materials, as in the mid-nineteenth century, and this was shown in the production of such things as synthetic raw materials from petroleum by-products and so on.[151]

The quest for a cheap source of raw materials supplied the justification for the continued maintenance of formal subsumption of labour under capital in colonial social formations. Such efforts were shown by the policy of the colonial state to exhort peasants to produce more for not only the export market, but also their reproduction and reconstitution. This phenomenon was made possible by the sustenance of precapitalist social relations of production within which the reproduction and reconstitution of peasant labour was supposed to take place. Such relations have been posed as the real impediment to 'development', but as is the case with other imperialist statements, it is necessary to turn it upside down and the right way up if its social contents is to be fathomed.[152]

It has been said that the character of a social formation is determined by the manner in which surplus labour is pumped out of the producer. Such are also the social relations which determine the nature of technology extant in a given social formation. Under formal control of labour by capital, as has already been indicated, the labour process is inherited from a previous mode of production. Capital insists on extending the working day and thus extracting absolute surplus value rather than on improving the labour process so as to bring down the cost of production. The technology employed in this instance is an inheritance from the past, and thus backward. Under such circumstances, crises abound, environmental and otherwise.[153]

Such points are important in the endeavour to explain ecological crises in colonial social formations. The quest for cheap sources of raw materials by industrial nations since the middle of the previous century entailed not only the commercialization of even marginal lands as was the case with the arid lands of Tanganyika but also the production of such commodities under extremely backward conditions of formal subsumption of labour under capital. Whenever there was an economic slump, colonial social formations were forced to commercialize new areas of their economic activities, and so bring down the prices of their products more than ever before. In that way, too, they helped lower the cost of production in the industrial nations

and provided markets for their finished products.[154] Indeed it was also during periods of crisis that ecological crises caught the attention of colonial proconsuls, and thus made colonial administration start worrying about soil conservation. Such, however, were the immediate causes which, although important in themselves, are also indicative of the fundamental causes of the crises. Crises are important because they help illuminate the main contradictions dominant in a given social formation.[155] In colonial social formations they help reveal the nature of capital and its relation to labour. Such is the usefulness of studying, inter alia, ecological crisis.

FOOTNOTES:

1. D.A. Low, Lion Rampant, London 1974, ch. 2. Bonaventure Swai, 'East India Company and the Moplah merchants of Tellicherry', Social Scientist, 8, 1979. V. Pavlov, Asian Dilemma, Moscow 1975 W. Rodney, How Europe Underdeveloped Africa, London 1975.

2. M. Bookchin, 'Ecology and revolutionary thought', Antipode, X - Xi, 1979. See also G. Dunbar, 'Elisee Reclus: geographer and anarchist', P. Kropotkin, 'What geography ought to be', and M.M. Breitbart, 'Anarchism and environment', ibid. The following studies too, will be of some use: C. Ake, 'Exploratory notes on the political economy of Africa', Journal of Modern African Studies, XIV, 1976. J. Schumacher, Small is Beautiful, London 1974. D. H. Meadows, et al. The Limits to Growth, London 1972.

3. H. Bernstein, 'Underdevelopment and the law of value: a critique of Kay', Review of African Political Economy, 6, 1976. B. Davey, Economic Development of India, Nottingham 1975. A. 'Agh, 'Labyrith in the mode of production controversy', Southern African Universities Social Science Conference, 1979. D. Bryceson, 'Primitive accumulation and imperialism in relation to the reproduction of Third World peasantries', Utafiti, forthcoming. E. Mandel, Late Capitalism, London 1976, ch. 2.

4. Low, Lion Rampant. N.P.P. Shimwella, 'Development planning in colonial Tanzania: a study in historical perspective', Dar es Salaam 1974 mimeo. J.M. Lee, Colonial Government and Good Government, Oxford 1967. E.A. Brett, Colonialism and Underdevelopment in East Africa, London 1973. D. Meredith, 'The British government and colonial economic policy 1919-39', Economic History Review, XXVIII, 1973. S. Amin, C. Atta-Mills, A. Bujra, G. Hamid and T. Mkandawire, 'Social Science and the development crisis in Africa: problems and prospects', Africa Development, III, 1978.

5. M. Perham, Colonial Sequence 1930-1949, London 1967, pp. 226-7, 232. Quoted by Low Lions Rampant, p. 71. See also R.P. Dutt, India Today, Calcutta 1970.

6. Low, Lion Rampant, p. 40.

7. The Colonial Empire 1939-47, London 1947, p. 11.

8. A.J.P. Taylor, English History 1914-1945, Oxford 1965, p. 299.

9. V.I. Lenin, Marxism on the State, Moscow 1978, pp. 100-27.

10. 'Developing Negro Agriculture: Lord Olivier's panacea', Tanzania National Archives (TNA) 13044, p. 1.

11. J.H. Plumb, 'The historians' dilemma', J.H. Plumb, ed. Crisis in the Humanities, Harmondsworth 1964, p. 25.

12. K. Marx and F. Engels, Selected Works, Vol. 1. p. 500. Quoted by I. Laptev, The World of Man in the World of Nature, Moscow 1979, p. 12. See also M.G. Chepikov, The Integration of Science, Moscow 1978 especially ch. 2.

13 K. Marx and F. Engels, Collected Works, Vol. 3, p. 276. Quoted by Laptev, The World of Man in the World of Nature, p. 23.

14. Ibid. p. 34.

15. C.W. Hobley, 'Preservation of wild life in the empire', Journal of Royal African Society, 34, 1935. See also his 'National sanctuaries: the key of the wild life position', ibid. 32, 1933.

16. Laptev, The World of Man in the World of Nature, p. 105.

17. C. Meillanssoux, 'Development or exploitation: is the Sahel famine good business', Review of Africa Political Economy, 1, 1974. See also N.N. Luanda, 'The plethora of agrarian programmes during the 1930s depression: Kingolwira, Ukiriguru, and Uzinza settlement schemes in colonial Tanganyika, Dar es Salaam 1979 mimeo.

18. Laptev, The World of Man in the World of Nature.

19. Meillassoux, 'Development or exploitation: is the Sahel famine good business?'

20. J. Iliffe, A Modern History of Tanganyika, Cambridge 1979, pp. 348-49.

21. Luanda, 'The plethora of agrarian programmes during the 1930s depression: Kingolwira, Ukiriguru, and, Uzinza settlement schemes in colonial Tanganyika.

22. K. Marx, Capital, Vol I, p. 300. Quoted by Chepikov, The Integration of Science, p. 67.

23. M. Watts and R. Shenton, 'Capitalism and hunger in Northern Nigeria', Zaria 1978 mimeo.

24. K. Marx, Capital, Vol III, p. 357. Quoted by J. Depelchin and S.J. Lemelle, 'Some aspects of capital accumulation in Tanganyika 1920-1940', Dar es Salaam 1979 mimeo.

25. B.A. Ogot, 'African ecology in historical perspective: problems and prospects', The Pan-Africanist, 8, 1979.

26. Ibid. J. Merryman, 'Ecological stress and adaptive response: a study of drought induced nomad settlement in Northern Kenya', The Pan-Africanist, ibid. L. Berry, et.al. 'Human adjustment to agricultural drought in Tanzania: pilot investigation', University of Dar es Salaam BRALUP paper, 1972.

27. 'Mwalimu warns against false optimism on oil', Daily News, Dar es Salaam, 27 October, 1979.

28. 'Minutes of the first meeting of the standing committee on soil erosion', 15 June 1931, TNA 77/2/33/2. Cited by Iliffe, A Modern History of Tanganyika, p. 348.

29. Rodney, How Europe Underdeveloped Africa, p. 7.

30. Dutt, India Today, p. 79.

31. Lord Hailey, An African Survey, London 1957.

32. E.P. Stebbing, 'The man-made desert in Africa', Journal of the Royal African Society, XXXVII, 1938 p. 39. W.E.C. reviewing Erosion and Soil Conservation by J.V. Jacks and R.O. Whyte. Joint publication of the Imperial Bureau of Soil Science...and. the Imperial Bureau of Pastures and Forage Crops', East African Agricultural Journal, 9, 1943-1944.

33. H.E.H. 'Soil erosion in many lands', a review of A. Grasovsky, 'A world tour for the study of soil erosion control methods', Imperial Forestry Institute Paper No. 14, Oxford 1938, ibid.

34. Ibid.

35. C.C. Watson, 'Erosion and Africa', United Empire, XXX, 1939, p. 702.

36. J. Dorst, Avant que nature meure, p. 148. Quoted by Laptev, The World of Man in the World of Nature, p. 101.

37. Ibid. p. 91.

38. G.V. Jacks, 'Prospects for soil conservation', East African Agricultural Journal, 8, 1942-43.

39. Ibid. pp. 71-72.

40. Watson, 'Erosion and Africa', p. 701.

41. Ibid. pp. 701-702.

42. Ibid.

43. Ibid.

44. Ibid. p. 702.

45. Ibid.

46. R.M.D. reviewing E.P. Stebbing, 'The man-made desert in Africa, erosion and drought', supplement to the Journal of the Royal African Society, 1938, East African Agricultural Journal, 4, 1938-39.

47. B. Bourdillon, 'Native production in the African colonies and protectorates', United Empire, 28, 1937, p. 147.

48. Stebbing, 'The man-made desert in Africa', p. 79. See also his 'Africa and its intermittent rainfall: the role of the Savannah Forest', ibid.

49. C.C. Watson, 'Erosion in the Empire', East African Agricultural Journal, I, 1935-36, p. 305.

50. V.I. Lenin, Imperialism, the Highest Stage of Capitalism, Moscow 1974.

51. For the economic image which the British ruling class had about the colonial empire see Brett, Colonialism and Underdevelopment in East Africa. Some reading of Taylor, English History 1914-1945, for the background political and social events to the kind of attitude which British politicians held towards the colonial empire.

52. Stebbing, 'The man-made desert in Africa', p. 3. See also supplement to the Royal Africa Society Journal, XXXVII, 1938.

53. Ibid.

54. R.M.D. 'Land usage and soil erosion in Africa', East African Agricultural Journal, 10, 1944-45, p. 79.

55. Stebbing, 'The man-made desert in Africa'.

56. R.M.D. 'Land usage and soil erosion', p. 79.

57. Ibid.

58. Ibid.

59. T.D. Thomson, 'Soil conservation: some implications', Journal of African Administration, V, 1953.

60. Journal of Royal African Society supplement, XXXVII, 1938.

61. Ibid. p. 7.

62. Ibid.

63. Ibid. p. 10.

64. Stebbing, 'The man-made desert in Africa', p. 40.

65. Ibid.

66. R.M.D., 'Land usage and soil erosion in Africa', p. 79.

67. L. Cliffe, 'Nationalism and the reaction to agricultural improvement in, Tanganyika during the enforced colonial period, Makerere 1964 mimeo.

68. A.B. Lyalla, 'Land Law and Policy in Tanganyika 1919-1932', LLM University of Dar es Salaam 1973.

69. See inter alia B. Rusibamayila, 'Soil erosion in Central Province', Dar es Salaam 1979 mimeo. Much of this will be covered in my forthcoming work on the Mlalo Rehabilitation Scheme utilizing Tanzania National Archives (TNA) Volumes 269/5, 269/58, 269/6, 269/7, 269/12, 269/13, 172/5.

70. Iliffe, A Modern History of Tanganyika, pp. 342-43.

71. Ibid. p. 349.

72. Ibid. p. 348.

73. F. Stockdale, 'Soil erosion in the colonial empire', Empire Journal of Experimental Agriculture, V, 1937. P.S. Baweja and S.V.K. Sarma, 'The sediment problem in Tanzania', Uhandisi, 4, 1978.

74. Lord Hailey, An African Survey.

75. Iliffe, A Modern History of Tanganyika, p. 349.

76. 'Native Agricultural', 18 August 1931. TNA 13044. See also Chief Secretary to all Provincial Commissioners, 14 October 1931, ibid.

77. Iliffe, A Modern History of Tanganyika.

78. C. Gillman, 'A geographer's restrospect and note on the Mpwapwa land-use experiments and achievements', East Africa Agricultural Journal, 8, 1942-43. S. Napier, 'A practical policy for tsetse reclamation and field experiment', ibid. 9, 1943-44. E. Harrison, 'Measures against soil erosion in Tanganyika territory', ibid. I, 1935-36. Anon, 'Preliminary notes on the soil erosion demonstration at the coffee research station, Lyamungu, Moshi', ibid. S.M. Gilbert, 'The history of a herd at the coffee research station, Lyamungu, Moshi 1935-45', ibid. 10, 1944-45. R.R. Staples, 'Combating soil erosion in the Central Province', ibid. 8, 1942-43.

79. Department of Agriculture: Technical and Specialist Officers' Reports for the year 1951, Dar es Salaam 1953.

80. Iliffe, A Modern History of Tanganyika, pp. 348-49.

81. R.R. Staples, 'Bush control and deferred grazing as measures to improve pasture', East African Agricultural Journal, 10, 1944-45.

82. P. Rigby, Cattle and Kinship among the Gogo, Ithaca 1969. M.B. Kwesi Darkoh, Man and Desertification in Tropical Africa, Dar es Salaam 1979. United Republic of Tanzania, The Threat of Desertification in Central Tanzania, Dar es Salaam 1977. C. Lefebure, 'Introduction: the specificity of nomadic pastoral societies', L. Lefebure, ed. Pastoral Production and Society, Cambridge 1979.

83. G. Dahl and A. Hjort, Having Herds, Stockholm 1976. G. Dahl, 'Ecology and equality: the Boran case' Lefebure ed. Pastoral Production and Society. L.E.Y. Mbogoni, 'Labour migration and famine', BA University of Dar es Salaam 1977. J. Seruhere, 'Underdevelopment in Chipanga, Dodoma', BA University of Dar es Salaam 1976.

84. P. Rigby, 'Pastoralist production and socialist transformation in Tanzania', Dar es Salaam 1978 mimeo. Dahl and Hjort, Having Herds.

85. Wolfe to Chief Secretary, 12 July, 1927, TNA 10846.

86. Ibid.

87. Ibid.

88. Ibid.

89. Central Province Report to Chief Secretary, May and June 1930, TNA 10846.

90. PC, Dodoma, To Chief Secretary, 29 September 1927, Ibid.

91. P. Rigby, 'Pastoralism and prejudice: ideology and rural development in East Africa', E.A. Brett and D.G.R. Belshaw, eds, Public Policy and Agricultural Development in East Africa, Nairobi 1969.

92. Lord Olivier, 'Developing Negro Agriculture', TNA 13044.

93. J.M. Moubray reviewing S. Howard, An Agricultural Testament, Oxford. Journal of Royal African Society, 39, 1940, p. 367.

94. Ibid.

95. Bonaventure Swai, 'Tanganyika and the locust invasion of 1928-33: was it an act of God?' Kale. 4, 1979, forthcoming.

96. Ibid. See also my 'Synthesizing the modern history of Tanganyika', Utafiti, forthcoming.

97. Iliffe, A Modern History of Tanganyika. H. Kjekshus, Ecology and Development in East African History, London 1977.

98. Annual Reports of Provincial Commissioners on Native Affairs for the year 1936 (ARPCNA) Dar es Salaam 1937, p. 6.

99. Ibid.

100. ARPCNA 1929, Dar es Salaam 1930.

101. ARPCNA 1931, Dar es Salaam 1932, p. 9.

102. Swai, 'Tanganyika and the locust invasion of 1928-1933: was it an act of God?'

103. ARPCNA 1938, Dar es Salaam 1939, p. 8.

104. ARPCNA 1942, Dar es Salaam 1943, p. 7.

105. ARPCNA 1943, Dar es Salaam 1944.

106. Ibid.

107. ARPCNA 1944, Dar es Salaam 1945, p. 1.

108. ARPCNA 1931, Dar es Salaam 1932, p. 2.

109. Ibid.

110. R.R. Staples, H.E. Hornby and R.M. Hornby, 'A study of the comparative effects of goats and cattle on a mixed grass-bush pasture', East African Agricultural Journal, 8, 1942-43. R.R. Staples, 'Bush control and deferred grazing as measures to improve pasture, ibid. 10, 1944-45. I. Mruma, 'Rejuvinating soil to boost agriculture', Daily News, Dar es Salaam, 13 December 1979. W.E. Ormerod, 'Environmental consequences of tsetse eradication', Pastoral Network Paper 8b, 1979.

111. ARPCNA 1933, Dar es Salaam 1934, p. 1.

112. A useful summary of these reports as well as the problem of overcrowding is available in R.J.M. Swynnerton, 'Some problems of the Chagga on Kilimanjaro', East African Agricultural Journal, 14, 1948-49'.

113. Ibid. See also Iliffe, A Modern History of Tanganyika, p. 350. D.H. Murray-Rust, 'Soil Erosion and Sedimentation in Kisongo Catchment, Arusha Region, Tanzania', MA Dar es Salaam 1970. B.A. Dattoo, 'Population density and agricultural systems in the Uluguru mountains, Morogoro district', University of Dar es Salaam BRALUP paper 1973, and 'Towards a formulation of Boserup's theory of agricultural change', Dar es Salaam 1976 mimeo. J.R. Mlahagwa, 'The Uluguru land usage scheme: crisis in colonial production', Dar es Salaam 1977 mimeo.

114. Department of Agriculture Annual Report 1931, Dar es Salaam 1932, p. 42.

115. 'Northern Province Annual Report 1934', TNA 11681.

116. Swynnerton, 'Some problems of the Chagga on Kilimanjaro', p. 126.

117. Ibid.

118. Ibid.

119. J.C. Curry, 'Eleusin cultivation by the Wachagga', East African Agricultural Journal, IV, 1939. R.J.M. Swynnerton, 'Onion cultivatic by the Wachagga on Kilimanjaro', East African Agricultural Journal, 12, 1977.

120. Swynnerton, 'Some problems of the Chagga on Kilimanjaro, p. 126.

121. Ibid. pp. 126-127.

122. Ibid.

123. Ibid.

124. Ibid. See also R.R. Baldwin, 'Native Authority afforestation on Kilimanjaro', Tanganyika Notes and Records, 21, 1946. ARPCNA 1935, Dar es Salaam 1936, p. 37.

125. Laptev, The World of Man in the World of Nature, p. 27.

126. Ibid. p. 31.

127. Ibid. p. 34.

128. Iliffe, A Modern History of Tanganyika.

129. Mruma, 'Rejuvinating soil to boost agriculture'.

130. Laptev, The World of Man in the World of Nature, p. 117.

131. Ibid. p. 118. See also H.K. Wells, Pragmatism, New York 1957. G. Novack, Empiricism, New York 1971 and Marxism versus Pragmatism, New York 1975.

132. A.M.M. Hoogvelt and A.M. Tinker, 'The role of colonial and postcolonial states in imperialism: a case-study of the Sierra Leone Development Company', Journal of Modern African Studies, 16, 1978, p. 73.

133. V.I. Lenin, Imperialism, the Highest Stage of Capitalism, Moscow 1974. B. Davey, Economic Development of India.

134. Bryceson, 'Primitive accumulation and imperialism in relation to the reproduction of Third World peasantries'. Bernstein, 'Underdevelopment and the law of value: a critique of Kay'. N.N. Luanda, 'The plethora of agrarian programmes during the 1930s depression: Kingolwira, Ukiriguru and Uzinza Settlement schemes in colonial Tanganyika, Dar es Salaam 1979 mimeo.

135. Bonaventure Swai, 'Native labour under colonialism', Tanzania Zamani, 21, 1979. M. von Freyhold, 'On colonial modes of production', Dar es Salaam 1977 mimeo. J. Depelchin, 'The beggar problem in Dar es Salaam', Dar es Salaam 1978 mimeo. D.V. Williams, 'The interaction of legal superstructure and economic basis in the process of colonization', Southern African Social Science Conference 1979. 'Agh, 'Labyrinth in the mode of production controversy'.

136. Mandel, Late Capitalism, p. 45.

137. Ibid. p. 46.

138. Ibid. See also K. Marx, Capital, Vol I, Harmondsworth 1976, pp. 1019-38. K. Marx, Grundrisse, Harmondsworth 1973. J. Banaji, 'Modes of production in a materialist conception of history', Dar es Salaam 1975 mimeo.

139. 'Agh, 'Labyrith of the mode of production controversy'.

140. K. Marx, Capital, Vol III, Moscow 1974, pp. 323-38. Bonaventure Swai, 'The East India Company and Moplah merchants of Tellicherry 1794-1800', Social Scientist, 8, 1979. Trade and Politics in Eighteenth Century Malabar, Trivandrum: Social Scientist Press, forthcoming.

141. R. Robinson and J. Gallagher, Africa and the Victorians, New York 1962.

142. E.D. Genovese, The Political Economy of Slavery, New York 1965; The World the Slave Masters Made, New York 1971.

143. A. Briggs, Victorian People, New York 1963, p. 22.

144. Mandel, Late Capitalism, p. 57-58.

145. Ibid. p. 61.

146. S.H. Alatas, The Myth of the Lazy Native, London 1975.

147. C.L.R. James, The Black Jacobins, New York 1967.

148. E. Whitecombe, Agrarian Conditions in Northern India, Vol I, Berkeley 1972. T.M. Metcalf, The Aftermath of Revolt: India 1857-1870, Princeton 1965. S. Gopal, British Policy in India 1858-1905, Cambridge 1965. W. Rodney, How Europe Underdeveloped Africa, London 1972.

149. Whitcome, Agrarian Conditions in Northern India, p.X.

150. Mandel, Late Capitalism, pp. 61-62.

151. Ibid. p. 62.

152. Swai, 'Synthesizing the modern history of Tanganyika'.

153. R. Samuel, ed. Village Life and Labour, London 1975.

154. G.K. Lieten, 'Crisis in capitalism', Social Scientist, 8, 1979.

155. M. Watts and R. Shenton, 'Capitalism and hunger in Northern Nigeria', Zaria 1978 mimeo. E. Mandel, Marxist Economic Theory, London 1971. M. Dobb, Political Economy and Capitalism, London 1968.