

Until a few years ago each parish on Møn had a school for 10–14 year-old children, and a school for 7–10 year-old children. East Møn has a private school for 12–17 year-old children and in Stege there is a school for 7–17 year-old children. At the moment the school system is under reorganization so that a single school for children from 7–17 years will serve an educational unit of two or three parishes. No more advanced education is found on the island than evening schools, a commercial school and a technical school in Stege and an elementary training school for nurses in Lendemærk. There are no 5th, upper 5th or 6th forms, no training colleges, no folk high school or agricultural high school. There is a public library in Stege as well as in each parish.

Stege has a hospital and six homes for the aged are found over the island. There are six doctors not including the three at the hospital, a midwife, four visiting nurses, two public health nurses and three dentists (in Stege). There are four veterinary surgeons – two of them for the artificial insemination service.

The island administration is conducted partly by the individual parish and partly by a central administration office in South Sealand.

Since 1943 Møn has been connected with Sealand by a bridge, 750 m. long, 26 m. high with a causeway of between 350 and 400 m. at each end to reach the land.

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SOME ASPECTS OF LAND USE AND OVER POPULATION IN THE NGONI RESERVES OF NORTHERN RHODESIA.

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With 5 Figures and 8 Photos.

Zusammenfassung: Landnutzung und Überbevölkerung in den Ngoni-Reservaten von Nord-Rhodesien.

Nord-Rhodesien, Teil der zentralafrikanischen Föderation, hat einen kritischen Punkt der Entwicklung erreicht: bisher haben sich Naturalwirtschaft und Geldwirtschaft für sich entwickelt; in manchen Gebieten löst sich die Struktur der Stammesgesellschaften auf, weil die arbeitsfähigen Männer abwandern; zugleich fällt es der kapitalintensiven Industrie der Föderation schon schwer, bei den gegenwärtigen Löhnen genügend Arbeitskräfte zu finden. All dies

verlangt nach grundlegender Änderung oder Stillstand droht.

Von den Reservaten sind besonders die von Interesse, in denen die Bevölkerung eine im Verhältnis zu ihren primitiven Anbaumethoden kritisch hohe Zahl erreicht hat. Überbevölkerung bei Mensch und Tier verursacht Raubbau, dieser Verarmung und Erosion des Bodens.

Dieser Aufsatz beschäftigt sich mit den Ursachen der gegenwärtigen Probleme in den Ngoni-Reservaten. Besonders hingewiesen wird auf die Gegenmaßnahmen der

Regierung zur Schaffung besserer landwirtschaftlicher Methoden, im einzelnen auf die Pläne für Kleinbauern und fortschrittliche Dörfler und die sie begleitenden Schwierigkeiten, Stammesgewohnheiten und -haltungen durch europäische Vorstellungen, wie eigener Landbesitz und Ernte zum Verkauf, zu ersetzen.

In the past fifty years the population of Northern Rhodesia has risen from 0.82 million to 2.51 million. By African standards a crude density of 8.7 persons per square mile (3.3 per km²) is low but the effects of the population explosion are already noticeable. In Eastern Luangwa there are already overcrowded regions akin to those of Kenya, Ruanda-Urundi, Eastern Nigeria and Southern Nyasaland¹. In this paper it is hoped to trace the causes of this pressure and their effect on the Ngoni Reserves and to describe features which may relate to a similar process of change in other rural areas of tropical Africa.

Physical Environment

In the plateau country to the east of the Luangwa river is found the Rhodesian offshoot of the Ngoni tribe numbering about 88,000 people, most of whom occupy part of the Fort Jameson district of the Eastern Province; another 30,000 Ngoni living in the Fort Manning District are divided off by the Nyasaland border. Structurally their country is part of the East African Plateau and has close affinity with Western Nyasaland. The plateau varies in height between 3,400' and 3,900' (1040—1190 metres) and some hills rise to just over 5,000' (1320 m). There is a broad division within the basement complex between the igneous and metamorphic types: the igneous group is chiefly represented by granites and granodiorites, the metamorphic group by schists and gneisses. In parts the two types have been intermixed but no detailed geological survey has yet been made and it can therefore only be noted that the igneous rocks preponderate in the centre, south and south west of the Ngoni area, giving way to the metamorphic and hillier country in the north. The granite country forms a mature peneplain with scattered inselbergen ("kopjes"). Soils derived from the parent rock form a sandvelt which is resistant to erosion and generally infertile. By contrast the schists and associated rocks have developed a topography of rounded hill ranges which slope towards shallow valleys. Soils range from hillside rubbles through red clay loams to

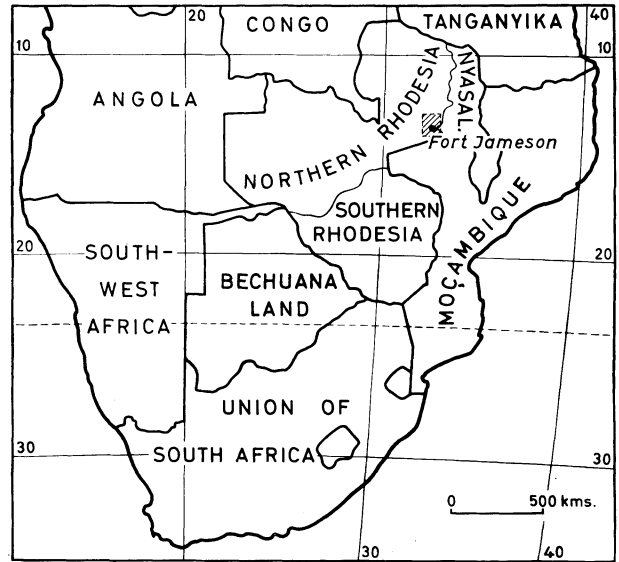


Fig. 1: Kee-map.

dark brown dambo²) earths (Fig. 4 [B]). Whereas the plateau soils, formed on the crystalline rock and ranging from sandy clay loams to coarse loamy sands, by their resistance to erosion and consequent preservation of the groundwater regime are not so vulnerable to human mismanagement, the richer metamorphic areas easily lose the absorbent top soil (fig. 4 [A]). Because of the maturity of the landscape there is a marked soil catena in both the metamorphically derived and the sandvelt country which can act as a useful guide to the present land use.

Because most rivers flow in the wet season from October to April — even the largest being no more than a series of stagnant pools at the end of the dry season — drainage is of great significance in settlement patterns. The topography is broken up by damboes or linear swamps which are infilled with heavy brown to black clay soils often fringed by sandy margins. F. DEBENHAM has already described the vital effect that these plateau swamps have on African life by their preservation of a ground water supply; although flooded after heavy rain, these swamps provide water

¹) For a review of the poorly known distribution of population and the meagre data available for its study in tropical Africa vide "Population Patterns in Tropical Africa", G. T. TREVARTHA and W. ZELINSKY, *Annals of the Association of American Geographers*, XLIV (1954).

²) Damboes, or linear swaps, occupy depressions in the mature peneplained landscape which have been infilled by the alluvium of the existing erosion cycle. These soils range from heavy clays to light marginal sands, the sequence and extent of which depend on the parent rock and the angle of slope of the shallow interfluvies. They represent a masked drainage being perennially wet and seasonally flooded. In the Ngoni sandvelt areas they are usually colonised by shorter grasses, *Eragrostis*, *Aristida* etc. but trees are normally absent. On the more fertile damboes of metamorphically derived soils taller grasses like *Hyparrhenia* are common with some species of *Acacia*.

holes and good grazing when the surface drainage has ceased (DEBENHAM, 1950). Drainage patterns in this small region are of interest mainly because the formerly more extensive peneplain is experiencing headward erosion by streams draining south and west to the Luangwa and lower Zambezi. This rejuvenation of drainage is being assisted by man made erosion referred to below.

Climatically the Ngoni region is one typical of the broadly uniform regime of the Northern Rhodesia plateau³). Because 98% of the average rainfall of 41 inches (104 cm) falls between November and April, the effect of heavy rain storms on fine textured soils which cannot resist sheet or splash erosion following removal of natural vegetation is of great practical interest in conservation. Temperatures are high only in the hot season between September and November and show an average maximum of 87° F. (30° C.) and average minimum of 76° F. (24° C.). After the "rains" from May until July there is a cold season with an average maximum of about 76° F. (24° C.) and average minimum of 54° F. (12° C.). Vegetationally the region is one of *Brachystegia-Isobertinia* woodland but this is nowhere climax vegetation because of the shifting cultivation practice and the former hillside gardens.

Historical Background

Located in parts of Northern Rhodesia, Nyasaland, Tanganyika, Southern Rhodesia and Mozambique there are today about twelve groups of the Nguni people who migrated from their Zululand/Natal homeland in the 1820's. The outcome of the Zulu domination was that a great wave of migrations moved northward through east and central Africa. The later stabilization of the various warrior groups into tribal societies like those of the Ndebele, the Shangana and the Kololo, within definite geographical regions has been in many cases most carefully investigated by sociologists⁴). From the geographical viewpoint it is important to note that the Ngoni nation was in effect an army on the march, which, because of its constant movement and acquisition of new land was able to retain a herding tradition (whilst using its own women and vanquished people for cultivation), to impose a dense settlement, and to preserve a balanced economy. Its remarkable pro-

gress through Africa was finally arrested by contact with Europeans although it had been defeated by the Bemba west of the Luangwa some thirty years earlier. At this juncture the Ngoni under Mpezeni ruled the country of the Luangwa-Shire watershed (LANEPOOLE, 1934, and BARNES, 1951). The tribe was obliged to settle in the region of what is now the Fort Jameson administrative district and came into immediate conflict with Europeans who were scrambling amongst themselves for African territory. As a result of the treaties signed by many of the local chiefs and the granting of a charter to the British South Africa Company in 1889, there was a hastening of British efforts to secure the Wiese Concessions through the medium of the North Charterland Exploration Company before Germany annexed the country. The early days of North East Rhodesia, administered as a private "estate" by the B.S.A. Company, are well chronicled and the "North Charterland Enquiry" (MAUGHAM, 1932) contains a compendium of documents which trace the interesting formation of the region.

When the Ngoni rebelled in 1897 and threatened officials of the Company four hundred troops from Nyasaland defeated ten thousand warriors. Defeat brought the Ngoni and N. E. Rhodesia under the Crown and the status of a protectorate dates from 1900. This new phase of white domination soon made itself felt by the spatial restriction of the tribe which was compressed between the alienated crown and farm lands and other tribal territory (Fig. 2). Until the military action the original inhabitants of the plateau region had been the Ansenga and Achewa, subject to the Ngoni. But with enforced contact with Europeans the Ngoni regimental system broke down and with it the source of tribal strength disappeared. In 1907 the first "reserve" was created to accommodate the growing number of landless villagers but the administration of the Ngoni area remained in the hands of the B.S.A. Company until the Crown took it over in 1924. For the first time there was formal recognition of serious overpopulation problems and as a result of various commissions and enquiries, reserves were delimited. This had the effect of reducing the degree but not the causes of overpopulation and the purchase of part the North Charterland Concession in 1941 (for £ 141,000), and, as recently as 1949, the repurchase of certain unoccupied European freehold land, was not a final solution. In 1952 a rehabilitation plan was started with the progressive resettlement of some Ngoni villages in unoccupied land to the north of the two existing Ngoni reserves.

³) The uniformity of the Northern Rhodesia climate is evidenced by the extensive dry woodland (Trockenwald) vegetation — the *Brachystegia* forests cover about three quarters of the protectorate which is the best naturally wooded country in Southern Africa.

⁴) For a bibliography and evaluation of the anthropological research so far achieved see M. GLUCKMAN, "Social Anthropology in Central Africa", Rhodes-Livingstone Institute Journal, No. XX (1956).

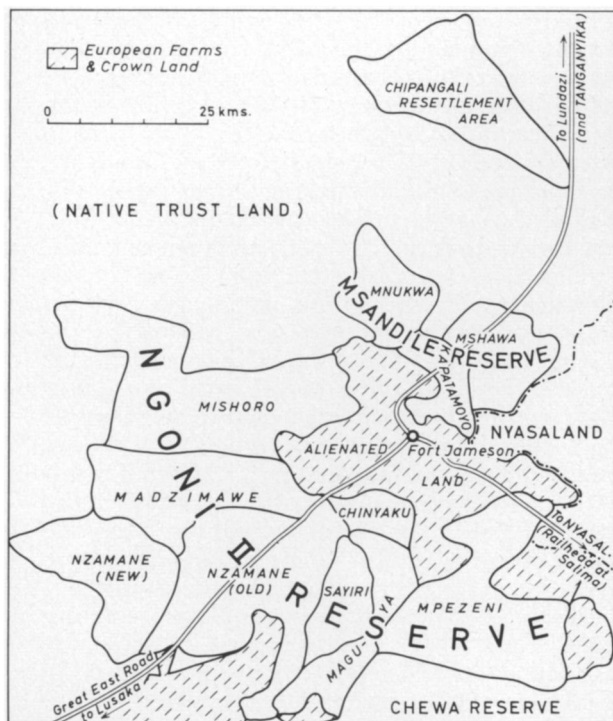


Fig. 2: The Ngoni Reserves and their Chiefdoms.

Note: In many cases the administrative areas of a chiefdom overlaps the boundary between Native Reserve and Native Trust Land; abandoned European farms have been partially or wholly absorbed; villages belonging to one chief may lie within the territory of another. All boundaries are therefore approximations and areas are taken as those recognised by the Provincial Administration. The Ngoni II Reserve covers 806 square miles and the M sandile Reserve a further 249 square miles, of which a small part is under Chewa chiefs.

The Problem

It was therefore clear that a problem existed and that most of the contributory factors were becoming more serious with time. The Ngoni tribe had become static spatially but its numbers had steadily increased within the original area of settlement. The carrying capacity of the land remained low because of the traditional agricultural methods and has even decreased because of soil mismanagement and attendant or resultant soil erosion, loss of structure and of fertility. Land hunger was the result of increased human and stock pressure arising from medical and veterinary advances which have upset the balance of nature.

Controlled movement of surplus population to low pressure areas was never attempted on a large scale. Technical measures to raise the carrying capacity of the reserves prove to be more easily introduced than the long term and radical altera-

tions in social attitudes which must accompany them⁵). As V. HARLOW has noted, "under the terrifying pressure of Western techniques and ideas Africans in many territories instinctively close the ranks for self-preservation: and the only ranks they know are those of the tribe" (HARLOW, 1955). Unfortunately this reaction continues and has hampered adoption of new techniques in the Ngoni reserves as elsewhere. It is therefore important to take into account that "detrribalisation", one of the effects of these European pressures and ideas, cannot be measured by the yardstick of the exodus which disintegrated feudal society in rural areas of western Europe. Whereas the Rhodesian "Copper Belt" is an industrial enclave of western society, there has been no Agricultural Revolution in the vast areas of tribal reserve and trust land which flank it. The normal situation remains one in which "the ingenuity of the Bantu people has not been to create more than a subsistence economy on the land, ill equipped with tools, low in productivity and wasting the energy, the time and the soil of the cultivator".

(DRACHOUSOFF et al., 1959). At present the improvements brought about by government agricultural services in the bush remain far above the norm for village agriculture. There exist the anomalies of European industry and primitive Bantu technology, mechanized farming and hoe cultivation. E. HELLMANN and others have already shown the inaccuracy of equating terms like "Europeanisation" and "detrribalisation" (HELLMANN, 1948). The two processes are not complementary for native labour is essentially migrant, flexible, and temporary when it enters the European orbit. At present there are, for example, about 39% of Ngoniland males living in their home villages. The remainder are absent at work in the province, in the territory or still further afield in Southern Rhodesia or South Africa; about half remain in contact with their home villages and will periodically return to them; many of the remainder will return permanently at the end of their working lives and this process has been strengthened by recent legislation (e.g. the "Vagrancy Acts" in Southern Rhodesia) discriminating against "alien natives" in migrant labour areas outside the territory. As will be shown, their tribal rights are a social insurance. Many men

⁵) The Ngoni automatically regard the European agricultural or district officer as members of the "white tribe" and from the time of conquest have resented the decision to allocate reserves to the subject Achewa. Moreover, political agitation has grown in recent years with opposition to "Federation"; necessary works like pegging out "bunds" and contour ridges have been interpreted as the demarcating of new European farms on tribal land.

make only a single labour migration and that for only two or three years. Those who remain absent for their working lives normally retire to their villages thereby strengthening the continuity of the social order and introducing new ideas. Their absence as able bodied young men is however conducive to a break down of the primitive agricultural system, and the free movement of labour perpetuates the lack of equilibrium in African society⁶). European precedent cannot be directly applied in planning to overcome disproportionate economic development, yet as evidenced by the low level of permanent urban settlement by Africans in Northern Rhodesia, the rural areas do not provide a solution by voluntary depopulation and intensification of productive activity. It might be argued that the regimented life in municipal or mine compounds achieves its aim of accommodating a working population and that the tribe and the administrator must cope with rehabilitation problems in the reserves. The present systems of encircling "white" towns by a girdle of African townships in the control of which the Africans have little say, has not led to the development of a sense of community so marked at bush village level. The Ngoni, like numerous other tribes, do not permanently become townsmen in most cases.

Population and its Relation to the Economy

The two Ngoni reserves together occupy 1055 square miles (2730 km²) in a belt of land encircling the European farmlands and Crown lands centred on Fort Jameson town. In 1960 there were 83,969 Africans registered within the tribal area. Men born within the area normally remain on the tax registers of their own chief of whom there are nine beneath the Paramount Chief Mpezeni: unless they break with tribalism their whereabouts are

normally known at the home village. Population returns compiled by the Provincial Administration are the only full estimates of the populace — there is no registration of births and deaths in the formal sense — and these are compiled in most cases annually as District Officers go "on tour" from village to village checking the tax registers⁷). (Sample surveys have been carried out on occasion and suggest that current totals are a slight under-estimation of the real population.) The returns compiled at present do not distinguish between those women and children who are present or absent from the tribal area; only in the case of taxable males is there a full breakdown into those working locally in the province, those working within the territory, those working in certain specified countries like Southern Rhodesia, South Africa and the Congo, and finally, those living at home. During the preparation of this paper the writer made a careful count of all the people living in two chief's areas, one in each reserve and totalling 6,942 persons. In a sample representing 6.7% of all women and children in Ngoniland it was found that 74.5% of the women and 62% of the juveniles were resident. It was therefore possible to add the known resident adult male population to the estimated total of women and children and on this basis 49,263 persons were occupying Ngoniland in 1960/61 giving an overall density of 47 persons per square mile. Such a working figure must be modified by the amount of cultivable land available and the land use system which varies from tribe to tribe. C. G. TRAPNELL has provided a sound ecological background to the calculation of land carrying capacity and has estimated that it varies in the Ngoni areas from 128 to 2.9 persons per square mile, according to soil type, the cultivation factor and the ratio of cultivated to regenerating land (TRAPNELL, 1953). Because traditional methods of cultivation require upwards of twenty acres (8 hectares) of bush fallow to every cultivated acre, an average carrying capacity of 25 persons per square mile would indicate that with present po-

⁶) Fort Jameson is linked with the capital (Lusaka) by the Great East Road and frequent bus services and the recently introduced "Sky Bus" air service of Central African Airways, bring the employment centres on the line of rail within a two day or two hour journey. Among young men paying their first poll tax an immediate labour migration is a mark of adulthood. Without the recommendation of the chief, the district officer does not usually issue an "identity certificate" without which a youth cannot seek employment: in recent years village elders have become more reluctant to push forward such boys for entry in the tax registers. The phenomenon is a common feature throughout Northern Rhodesia and absenteeism varies between 25% and 75% of adult males: there is no legislation controlling the influx of males to urban areas in the territory but recruiting agencies for the South African mines are granted certain provincial quotas and the movement of "alien" Africans in Southern Rhodesia and South Africa has been restricted in recent years.

⁷) R. W. STEEL in "The Population of Ashanti: a Geographical Analysis" (Geogr. J. CXII, 1948), states that "unfortunately the published census figures in most British colonies — indeed, in all tropical countries — are quite inadequate for the purposes of the geographer". This criticism is still valid and the population geographer has to exercise considerable ingenuity in combining such factors as communications, hydrology and soils with the social determinants such as the schism typical of many tribal groups, to avoid arriving at meaningless crude arithmetic ratios of population to land. Particularly under shifting cultivation systems, found throughout Northern Rhodesia, the administrator frequently finds new settlements established and old villages abandoned from one tour to the next: maps must be redrawn on each occasion.

pulation the mean "population/land factor" is already 1.9 over the Ngoni areas⁸⁾ (Fig. 3).

The carrying capacity of Rhodesian soils is

generally low and the following table illustrates the seriousness of the problem in four of the southern chiefdoms in the Ngoni region: —

Chief	Total area	Cultivable area	Estimated resident population (1960/61)	Density per cultivable square mile
Chinyaku	10,646 acres	7,634 acres	1,300	109 persons
Maguya	18,670 acres	13,226 acres	3,814	185 persons
Sayiri	18,100 acres	11,526 acres	2,633	146 persons
Mpezeni	89,918 acres	38,859 acres	7,842	129 persons

Where it is possible to compute statistics from broad ecological divisions within the area of each chief, the degree of overcrowding is seen to be more serious. M. PRIESTLEY and P. GREENING were able to carry out such a survey within certain of the southern Ngoni chiefdoms during 1954/55 as part of the Government's aim of studying conditions at "ground level" in conjunction with the analysis of aerial photography; they found that some of the best soils were supporting a peak density of 380 persons per cultivable square mile (PRIESTLEY & GREENING, 1956). According to the annual returns of the Provincial Administration there appears to be an average yearly increase of 3—4% in population in the Ngoni reserves and the population/land factor must be expected to worsen. W. ALLAN (1949) and others have shown that the delayed impact results from the continuous cultivation of good land, the employment of marginal land in damboes and on hill sides, and the "squatting" which has occurred in unoccupied European farmland contiguous to chiefdoms. These factors have obscured the problem and staved off threats to the survival of the people under present conditions, but localised population/land factors of 7 and above must further increase with population upsurge and soil impoverishment.

Stock

The pressure of stock on available land has increased as markedly as that of the tribe. The number of cattle in Ngoni areas rose from 33,674 in 1955 to 55,814 in 1960. To a herding tribe, cattle are primarily a means of investment and an

indicator of wealth for which no suitable alternative has been adopted from the European material culture. Disposal of cattle usually involves the sanction of several relatives and failure to comply with native custom may provoke family friction. Cattle are regarded as frozen assets and although as prestige symbols the corn grinding mill and "vanette"⁹⁾ rank highly, very few Ngoni risk selling their herds. This reluctance to sell is

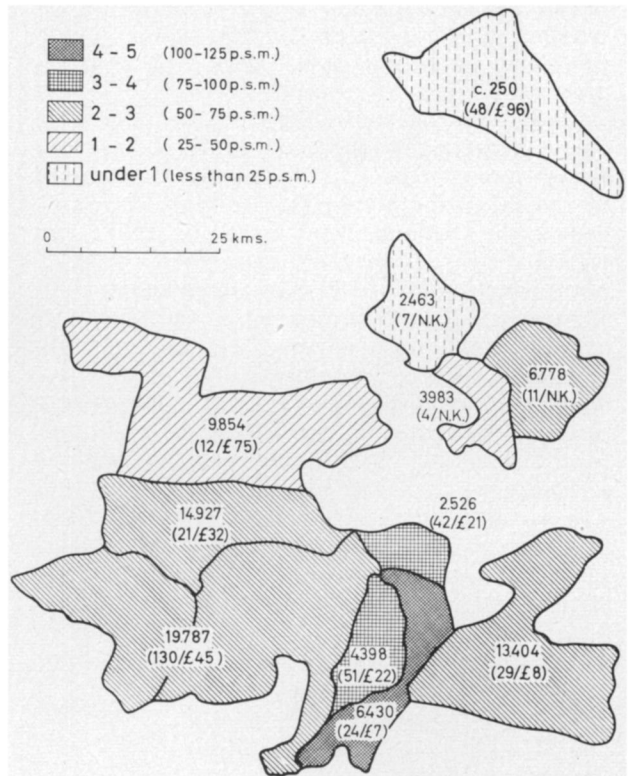


Fig. 3: Population / Land Factors: Ngoni Chiefdoms. (Based on estimated resident population 1960/61 and critical population density of 25 persons per square mile under Ngoni maize cultivation). De facto population (Tax Registers) shown thus: 9,845, 14,427 etc. Numbers of improved and peasant farmers and average farm incomes in third year shown thus: (12/£75) etc.

Where third year income not yet known — 'N. K.'

⁸⁾ The term "population/land factor" conveniently defines the relationship of the optimum to the actual human pressure on the land. It may be expressed as the total population divided by the estimated carrying capacity of the land. The simple formula to determine the area of land needed per head is $\frac{100 CL}{P}$ where C is the cultivation factor, (i. e. the number of garden areas under a particular type of native cultivation to permit a complete cycle of cultivation and regeneration to occur); where L is the mean average of cultivated land per head at one time; where P is the cultivable percentage of the particular vegetation-soil type.

⁹⁾ A 30 cwt truck.

partly because cattle are in an African sense a form of currency and there is therefore no incentive to improve breeding or to rationalize stocking. Optimum stocking would probably be 32 to the square mile whereas it is at present on average 53, and locally and seasonally it may rise to one beast per acre. Cattle are on free range and the herd-boys are primarily concerned to keep them away from cultivation; there is no systematic grazing. Many areas are therefore so overgrazed and overstocked that the grasses are trampled and killed, soil cohesion is lost with destruction of the plant cover, and erosion, particularly in dambo areas, is accelerated. Village oxen are not used customarily for draught purposes except on improved farms coming under European supervision (There are only about 450 ploughs in the Ngoni areas). Manure is not spread on the land although the value of former kraal sites is well understood. As sheep and goats are also kept in considerable numbers the result is that by selective feeding the livestock contrive to remove most of the vegetation cover in their pasture before the end of the dry season.

Stock reduction must therefore devolve upon the social attitude to the kraal. M. READ has made a most interesting study of the culture change of the Ngoni in the Nyasa highlands which is relevant to the area under review (READ, 1938). Her record of the resistance to change where the Europeans have tried to develop a commercial attitude towards tribal herds is matched by the experience of the animal husbandry officers amongst the Rhodesian Ngoni. Recognition that there are too many poor quality animals is not relevant to a society which regards the cow as a traditional form of banking which cannot disappear without a replacement form of security. Such an attitude will not alter until there is more trust or interest in European ideas of material possession. In her survey, the author summarizes the purpose of the (Nyasaland) Ngoni cattle as providing the people with "*security, religious, social, legal, and the values thus inherent in the possession of cattle are rooted in the Ngoni cultural tradition*".

Agricultural Land Tenure and Agricultural Methods

Land tenure is a simple recognition of individual usage. This usufructuary right obtains throughout the Ngoni country and all land is vested, to Ngoni minds, in the hands of their Paramount Chief (Mpezeni) — although in fact the Secretary of State for the Colonies is legally invested with their control. Land therefore has no monetary value and inheritance is essentially the retention of usufructuary rights by kinship groups. C. WHITE

has shown that rights over land can be transferred by gift or loan and that the conception of sale is not unknown amongst Africans (WHITE, 1959). This fact will be of great importance if freehold land tenure is introduced but one virtue of the existing system has been that fragmentation by inheritance has not occurred and no parasitic class of money lenders as in India has developed. At present grazing occurs on common land; but other areas come under group ownership, often that of the family. Absentees may return and claim their rights to cultivate but this must, in overpopulated zones, occur mainly where rights have been abandoned on fallow land. It follows that capitalization of the land is virtually impossible without title for security on loans and there is, moreover, no process of natural selection amongst subsistence cultivators in that tenure of this sort has provided collective security but has retarded individual progress and initiative. Because there is a small but growing class of cash crop farmers, the archaic system itself constitutes part of the overall problem under review.

It has already been shown how, under the Ngoni social organization in pre-conquest days, agriculture was a secondary concern delegated when necessary to serfs and women. An Ngoni saying states that in time of peace their spears were their hoes. That their system was effective is clear from the reports of contemporary European explorers. Close settlement was part of the peacetime deployment of warrior people and it has been estimated that the population was at least 100 to the square mile at that time and rose locally to 300 persons. As shifting cultivation was the root of Ngoni agriculture — it is today often no longer possible in areas where villages are now often little more than a quarter mile apart — the present day restriction is the crux of the overpopulation problem. Mound cultivation¹⁰⁾ was formerly general but the introduction of new seeds by Europeans developed ridge cultivation which practice has been consolidated by Native Authority bye-laws on contour ridges and soil conservation. Because the Ngoni moved continually from clearing to clearing and systematic rotation and manuring were unknown, their agriculture required a high percentage of fallow land for each unit under cultivation thereby lowering

¹⁰⁾ For a full description of Ngoni land use vide C. G. TRAPNELL, op. cit., pp 83—87. Mounds are made by hoeing together soil and grass over which tree branches are burned. These may vary in size with soil type and in coppice country the trees may first be burned. Separated by only a few feet, such mounds are conducive to speedy run-off and the erosion of the more fertile and incoherent top soil is sometimes akin to "sand castles" collapsing with the incoming tide.

the critical population ceiling as the proportion of cultivated land to bush fallow widened. Because of the very wide variation in soil type and fertility the cultivation period may itself vary between two years on a sandy type to twenty years on the richest clay loams. Twenty years may elapse under bush fallow, as opposed to grass fallow, before the soil regains its fertility.

Maize is today the staple crop and yields range between 400 and 4,000 pounds per acre. Ant hills are found sporadically in all soils and invariably give the best yields, being distinguished by tall stands of grain towering over the surrounding crop. On the common soil types, the red clay loam generally gives the best yields whereas some of the sands and rubbles are scarcely worth tilling. On all soils there is a steady decline in crop yields after each year although some of the newest soils are at their best only after the second year of cultivation. Where mound cultivation is still practiced, the plant population always falls below the optimum obtained on ridges; well populated maize crops should average 14,500 plants to the acre but mounds are usually planted at the rate of about 2,000 to the acre.

The failure to cultivate in lines may not only reduce potential yields because of lack of plants but it may also, as in the case of groundnuts, fail to develop the best microclimate beneath a continuous plant cover and encourage plant disease and pests and also speed up the loss of moisture. It is interesting to note M. READ's contention based on the oral and written tradition of the Nyasaland Ngoni that the tribe's techniques have deteriorated since European penetration (READ, 1938). In the words of their Paramount Chief, "*they forgot the cultivation of their ancestors*", which included drainage, use of decayed vegetable matter and manure, and ridging. It was observed moreover that "by virtue of their political and social authority *big men and women had authority to teach and enforce intelligent methods of cultivation*". The writer repeated these observations to a meeting of all the Ngoni chiefs at Fort Jameson in 1961: the oldest stated that their fathers had recognized the dangers of running water on the top soil and had practiced better agricultural methods but that today, however poor the yields, it was often necessary to cultivate gardens continuously. Even with cash incomes it was expected by Ngoni society that each man would have a garden. So it was that the breakdown of the old regimental system probably brought about the decay of collective efficiency and effort in the fields of war and subsistence. (The Ngoni as a warrior tribe retain little of the self respect and tradition so marked in the Lozi

of Barotseland for example). The old stimuli have been removed and the provision of new incentives to raise the village agriculturalist above subsistence level to a cash cropping basis are essential¹¹). Needless to say, the practical aspects of incentives in the matter of markets, better communications, price stability, and viable farm units, remain, as elsewhere in Africa, the most problematic factors of rural economic development. Until the population explosion in Africa was recognized it was convenient to plan for a phased transition to the cash economy but present circumstances demand an overnight transformation¹²).

Soil Erosion and Deterioration

The most obvious evidence of overpopulation, overstocking and poor agricultural techniques within the Ngoni reserves is interference with the natural condition of the soil. C. TRAPNELL noted that "Reserve II (South Ngoni) presents an example of combined cutting out, soil deteriora-

¹¹) Northern Rhodesia has instituted a five year development plan (1961—1965) costing £ 33 mill. for rural areas. The "Report of the Rural Economic Development Working Party", Government Printer, LUSAKA, 1961, usefully outlines official policy in regard to development throughout N. R. Provisional targets for 1965 are 900,000 lbs of maize, 1,250,000 lbs of tobacco, 4,500,000 lbs of groundnuts, 800,000 lbs of cotton and 12,000 head of cattle from the Eastern Province. Recently negotiations have taken place to resettle the remaining European farmers, numbering about 25, on crown land along the line of rail. The isolated tobacco and maize farmers have been at a great disadvantage over transport costs, although the Nyasaland labour market has partially compensated them—recruiting agencies for the N. R. "maize belt" farms have had to range far afield in the Barotseland Protectorate and N. W. Province to induce bush Africans to take up farm labour, the most unpopular form of paid work. Clearly, the targets will only be achieved if there is a great swing to cash cropping at village level but the same determinants are likely, however modified, to effect the disposal of village surpluses.

¹²) W. J. BARBER in his recent study of the interaction of the indigenous and money economy in the Federation ("The Economy of British Central Africa", Oxford University Press, 1961), has demonstrated that a stage of "quasi-full" employment has been reached which is critical to the future orientation of economic development policy. Without capital investment in the indigenous sector the elasticity of the native labour supply on which large-scale expansion of industry depends, may disappear until the real per capita income in the reserves is raised. The urgency of this inevitable adjustment is underlined by the facts of the Federal Government's commitment to a programme of industrialization which has been capital-intensive and which has had to draw on extra-territorial labour to maintain its momentum at existing wage levels. To draw further numbers into the money economy it will therefore be necessary for the urban worker to be offered higher wage rates and the peasant farmer to expect better returns from cash crops. The Ngoni areas are therefore test cases for by definition the dualism in the economy cannot persist in the face of high population/land factors.



Plate 1



Plate 2



Plate 7



Plate 8

Plate 1: (J. A. HELLEN). Continuing hillside cultivation in the Ngoni area across the border in Nyasaland.

Plate 2: (J. A. HELLEN). A good example of what is being aimed at by the Ngoni Native Authority Soil Conservation Ordinance. Bunds and cultivation and contour ridges in badly gullied hillside gardens. (Uluguru Mountains, Tanganyika). Ngoniland is benefiting from new techniques transplanted from the British East African territories as a result of study tours by administrators and agriculturalists.

Plate 3: (by courtesy of the N. Rhodesia Information Department) Overgrazing and sheet erosion.

Plate 4: (by courtesy of the N. Rhodesia Information Department). Erosion of roadside caused by inadequate storm drains.

Plate 5: (by courtesy of the N. Rhodesia Information Department). Gully erosion into dambo soils. Outwash deposited by sheet erosion above original dambo level shown by arm.

Plate 6: (by courtesy of the N. Rhodesia Information Department). The major "Nyasaland Gully" in the south Ngoni area which has developed as a result of extreme overcrowding of the adjacent Mpunza dambo and accelerated run-off. Mechanical checks have failed and policy is now to depopulate the area, to control run-off, to shave and grass the banks, and to facilitate natural silting up by building brushwood check weirs.

Plate 7: (J. A. HELLEN). One of the two markets at Fort Jameson where over sixty Africans earn a good cash income from "dimba" gardens. With 11,000 people in the township a wide range of vegetables and some fruit is grown for this trade which grosses £20 to £60 a year for the individual.

Plate 8: (J. A. HELLEN). The Kali-Kali dam in the Chipangali Resettlement Area, showing typical sandvelt country with "kopjes" at dambo head. Rice and bananas are cultivated on fringe; the waters of the conservation dam should yield 100 or 200 lbs of fish per acre each year and the fish ponds beneath the wall, where systematically fed, 2,000 lbs. Bilharzia is a hazard in such static waters.

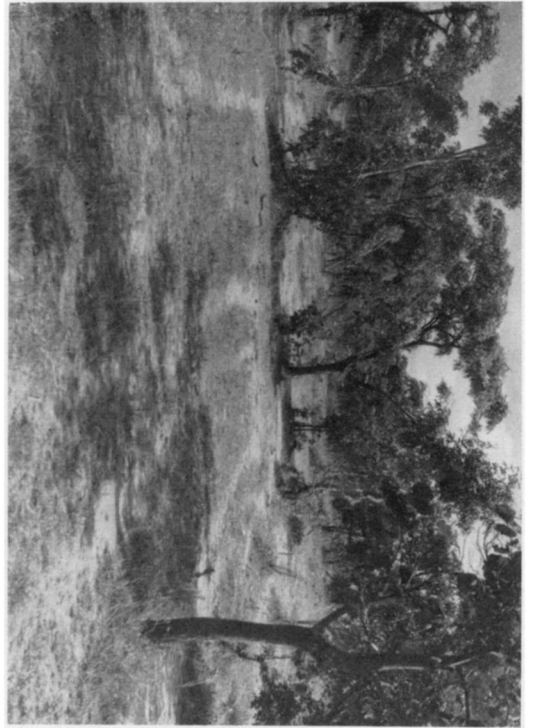


Plate 3

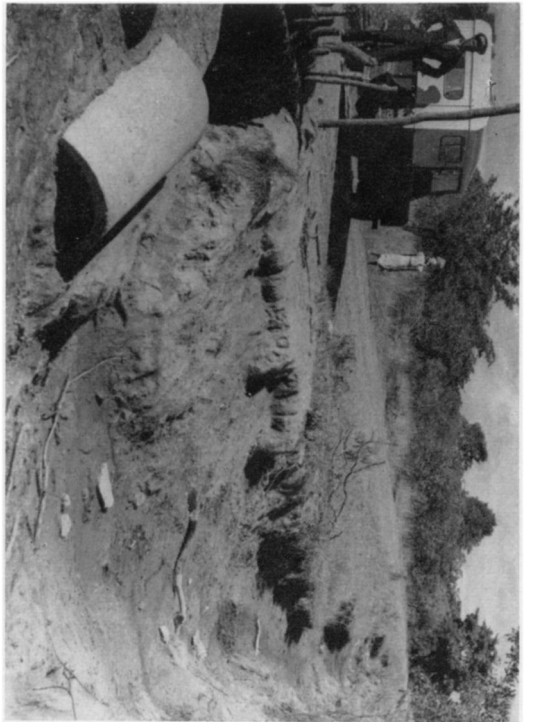


Plate 4



Plate 5

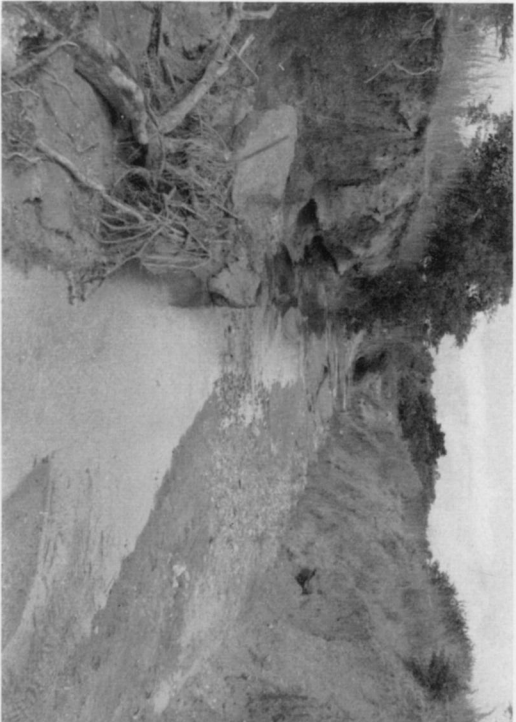


Plate 6

tion and erosion which probably has no equal in the territory" (TRAPNELL, 1953). Rainfall because of its intensity can inflict severe damage where vegetational cover has been removed in the dry season and Ngoni land use cause soil deterioration to an almost unbelievable degree. Because forest and grassland soil can only be cultivated if soil structure is retained, the loss of structure caused by the removal of plant nutrients and organic matter by continuous cropping, facilitates sheet erosion when the soil ceases to be absorbent (Pl. 3). Progressive desiccation results from interference in the groundwater regime and causes dry season water shortage. The natural outcome is itself cumulative as the surface water flow becomes a more efficient agent of erosion. Hillside cultivation in the most crowded areas aggravates denudation of plant cover, cattle seek food on steep slopes, and gullying frequently occurs with the result that coarse soils may be outwashed and deposited on better soils (Pl. 5). Overgrazing in the damboes is often so acute that vegetation dies and with its removal the arrested drainage of the swamp is upset and it quickly becomes subject to gullying in its clay and sands. Overall this unnatural erosion gets out of hand and the term 'devastated area' can be applied; in the south of the Ngoni reserves there is a region of interlocking gullies which has gone far beyond the range of normal reclamation measures¹³ (Pl. 6). At the present time a transformation has been caused by continuous soil conservation propaganda and the change to ridge and furrow gardens with storm drains and contour ridging continues. Since 1930 the cultivation of hill slopes, which formerly took place on inclines of 30° to 40°, has been forbidden. But much of the low carrying capacity of the land today is the direct result of the rape of the earth which has persisted for generations. Such deterioration of the soil as continues is attributable to village communities which fail to

understand the necessity of contour ridging and 'early burning' of scrub land before intense heat from late dry season bush fires destroys plant roots, and to a mentality which does not relate cause and effect.

Rural Development and Resettlement

Response to the incentives of a cash economy commonly take the form of migration to centres of paid employment or of local cash cropping. Employment fields outside the region are scattered widely from South Africa to the Congo border. The "Copper Belt" towns are popular with the Ngoni and of those workers outside the province the ratio of those in Northern Rhodesia to Southern Rhodesia is two to one. Local opportunities of paid employment are restricted almost entirely to work in government departments or on European farms. The township of Fort Jameson absorbs a small number of domestic and shop workers. Probably the total of employed Africans within the entire Eastern Province does not exceed 6,000 out of a total population of 400,000. Until the African employer becomes more important the dominant sector of rural economic development will remain that of the village cultivator.

Three schools of thought can be discerned in regard to social and economic treatment of such a problem. There is first the laissez-faire doctrine of self determination in the rate of progress by the villager himself and this is in effect what happens in sparsely populated provinces of Northern Rhodesia like the North Western. Secondly there are planners who favour the creation of a peasant class modelled on the European smallholder. Thirdly there is the belief that the communal orientation of tribal society is best diverted into the collective farm or Kolchos. Except where coercion is employed, unco-operative elements of the rural proletariat will continue to enjoy self determination until their marginal existence becomes totally uneconomic; the British colonial administration would not venture to test either the "travail obligatoire" of some independent African states or the introduction of legislation compelling annual paid employment as in Angola, at this juncture; for these reasons laissez-faire doctrines will be applied only in districts with low population/land factors. Nevertheless this métier remains the norm in many parts of Africa, particularly where the only capitalization is forthcoming from governmental agencies and attempts to streamline the body of subsistence agriculture must continue to involve opposition to technical advance. In the Ngoni areas there is a desire for the fruits of

¹³ GILLMAN ("Accelerated Erosion as a Consequence of Human Activity", in *Zeitschrift für Geomorphologie* vol. 7, 1932—1933) termed this "accelerated cyclic erosion". He noted that in Tanganyika it arose from the activities of man, particularly in the replacement of natural vegetation by culture steppe, on the alluvium of the existing cycle. Whilst on tour in the rains in Ngoniland the writer has observed how sheet flood makes use of any breaks of slope such as foot paths or garden furrows which become streams and incipient gullies within minutes. In the drier areas of Southern Rhodesia. J. PRESTCOTT "Overpopulation and overstocking in the Native Areas of Matabeleland", *Geogr. J.* vol. 127, part 2, pp 212—224, has noted that flash flooding has created spectacular gullies under similar soil and land use conditions. Whereas in Matabeleland the silting of reservoirs results, in Ngoniland gullying is accelerating the rejuvenation of drainage in the upper watershed region and damage increases at geometric progression.

change accompanied by a deep suspicion that the foundations of tribal custom may be profaned by the technical élite¹⁴). S. FRANKEL has observed that "in all African territories the development of modern methods of economic organization is in a greater or lesser degree accompanied by increasingly rapid disintegration of indigenous economic and social structure" (FRANKEL, 1952). But ultimately this symptom has to be recognized and the sentiment ignored if there is to be advance, for, as in W. MACMILLAN's words, the meeting of the races is "an historical fact not an historic event" (MACMILLAN, 1953). The mental hurdle between the technical élite and the tribal masses has to be cleared before economic reconstruction can occur. This social engineering has first to occur irrespective of plans to strengthen agriculture by the group approach of collective farming or the individual approach of peasant farming. R. STEEL has recently introduced a useful term to the language of human ecology — the 'inventory' of land and people (STEEL, 1960). By this is understood a detailed review of all those factors involved in the man/land relationship. The basis of any projected reintegration of African society is such an inventory of existing human and material resources. The wide application of this term inventory, is, it is hoped, justification for close inspection of social determinants which have acted and continue to act on Ngoni problems.

Particular Developments within the Reserves

In the Ngoni area most development is controlled and initiated by Europeans acting on behalf of governmental agencies. Such activity has involved a distinct approach to 'old' areas of settlement and 'new' areas of resettlement; it has also entailed improvements to the structure of village farming and the encouragement of a new class — the peasant farmer. Such work has been fitted into the general framework of agro-economic development in the Eastern Province and the protectorate as a whole.

¹⁴) Whether or not this élite is European does not, in the writer's experience, appear to weigh heavily with traditionalist elements. Under the well tried system of indirect rule Native Authorities have been created to perform most local government duties. Striking a balance within councils made up of traditional elements (chiefs, headmen etc.), elected members, and paid officials, (agricultural, veterinary, financial and education "councillors" etc.) is difficult where respect and authority lie with one element and not with another. Trained junior agricultural or veterinary staff whether working as servants of the central government or on secondment to "native authorities", may encounter a total lack of co-operation due to suspicion of motives or resentment where a member of a "foreign" tribe is working outside his own "country". Suspicion of European specialists takes a more polite form.

The Old Areas: In the old village lands is found the dead weight of tribal conservatism. Soils are often overworked or exhausted and consequently worsen the land hunger. Agriculturalists working within such areas are mainly concerned with inculcating certain basic tenets of better land use: for example, contour ridging, line sowing, abandonment of the interplanting of crops, and the preservation of the plant cover. No great progress can be expected without the reduction of human and stock densities, and the creation of an artisan class in turn depends on higher living standards resulting from improved land use elsewhere. Rapid urbanization is unlikely to provide a quick solution. In the interim, the villagers are encouraged to grow small cash crops of groundnuts and tobacco at guaranteed minimum prices, but such cropping can receive severe setbacks as a result of market fluctuations. In some cases a "black market" develops because the villager imperfectly understands the law of supply and demand and refuses to accept a fall in producer prices. Similarly others may be deterred when lack of experience leads to poor yields in experimental crops or when high yields of grain cannot find an outlet to distant markets. Great improvements have, however, occurred in relative standards of agriculture by the strict enforcement of Native Authority rules and orders relating to soil conservation. Although the great expansion of productive capacity is impossible, the foundation is being laid for future increases in specialized hand tended crops by conserving such natural resources as remain. Within the 'old' areas are found some improved farmers but these will be considered below. Such men do by their success influence backward cultivators and have begun the long process of a universal change from hoe to plough.

The New Areas: Unused land is the focal point of development work in the Ngoni region. It occurs mainly in zones taken over from European farmlands by re-purchase or as extensions into unoccupied tribal country from the existing colonized chiefdoms. Certain villages have been persuaded to move from the areas of worst overcrowding and are now resettled under the direct supervision of resident agricultural staff. This controlled colonization enables some of the worst mistakes to be avoided and serves as a useful shop window to demonstrate the advantages of improved agriculture. Because the Ngoni are surrounded by the chiefdoms of Achewa and Akunda and alienated land, scope for such colonization is severely limited, but a second area, distinct from these additions along the margins, lies to the north of the two reserves within Chewa tribal country. The area, Chipangali, extends over 280 square

miles of predominantly sandveld country which has probably remained unoccupied since the Ngoni warriors frightened away the Chewa cultivators a century ago. It has the advantage of being in effect virgin country because few villages had moved back due to an acute shortage of surface water and an advancing tsetse fly belt. When it became obvious that Ngoni overpopulation was reaching serious proportions some outlet had to be found. Even though the selected area was sixty miles north of the main devastated area, resettlement could occur only northwards. Access roads had to be constructed and an extensive programme of water development was started before it was possible to tackle the complex problems of movement of people from their traditional lands. Poor water supplies and a "fly belt" would have prevented herding and without their cattle the Ngoni would not move. Resettlement therefore involved recognition of the tribe's cultural needs as much as its poverty. The expensive and extensive operation of destroying the habitat of the tsetse fly by bush clearing and game control — and thereby removing the threat of bovine trypanosomiasis — has continued to the present day and steadily more land is being made available westward towards the Luangwa valley. Since 1944 the fly limit has been pushed back over 10 miles. Two hundred wells have been dug and eight dams built on dambo sites to ease the water problem; the construction of dams, costing between £ 2,000 and £ 4,000 each, has ensured that cattle, so necessary for draught purposes in the new farm blocks, could move with the people (Pl. 8).

There are already twelve resettled villages and forty six peasant farmers in Chipangali and some of the suspicion has already disappeared as the success of the transfer becomes obvious. Chiefs were dubious of their position being undermined when some of their people moved outside the immediate control of their courts. Further development has been delayed by lack of funds but work continues on the provision of a settlement nucleus of school, courthouse, stores and a dispensary. Chiefs have as a result come to think of the resettlement area as an extension of their own spheres of influence where they can hold their courts to administer native customary law in the traditional manner: their support is of utmost importance in the arrangement of future transfers. The regional plan provides a basis for the immediate resumption of population transfer but the vast expense of transporting entire villages with their possessions is not easily surmounted. Ultimately 4,000 Ngoni will be resettled in Chipangali. A similar problem on a grander scale existed when the Valley Tonga were resettled with the rising of the

new Lake Kariba and W. REEVE has outlined some of the difficulties which surrounded the transfer of over 30,000 villagers (REEVE, 1960). Forty peasant farms remain demarcated but unoccupied for reasons described below. In the case of Ngoniland it is evident that such development planned from ground survey is the only practical solution to rural development by a colonial government, but in common with other free economies the problem is to equate heavy capitalization with the maintenance of existing services elsewhere. The Ngoni Native Treasury enjoys an annual revenue of a mere £30,000 and in common with all other treasuries could not invest in long term projects with the existing per capita income and tax system.

Peasant Farms: A. RICHARDS has described many of the interesting changes which have occurred amongst the Bemba people in the adjacent Northern Province in the space of 23 years since she worked amongst them (RICHARDS, 1958). She remarked that the policy of the Government was "to stabilize the population on better soils" and "to convert the native from subsistence to cash economy by the development of peasant farms". The Bemba are primarily shifting cultivators using the 'chitimene'¹⁵⁾ system of pollarding and ash fertilization. They are not a cattle conscious people and cannot work oxen skilfully. Dr. RICHARDS noticed that four peasant farm settlements "had proved a disappointment in spite of their costly nature". There have been no such failures in Ngoniland with the peasant farmers who to a certain extent overlap her class of "self improved" farmers — men who have returned from the urban areas to Bembaland. Many of these are enlightened men and are found in peasant farming schemes. In Ngoniland there were eight farms in the season 1951/52 and in the season 1960/61 this total had risen to 379 farmers on block units or single farms. Ninety three of these men were farming on the block farms occupying new or regenerated lands; the remaining 286 men were living on village lands mainly in the areas

¹⁵⁾ TRAPNELL distinguishes several types of chitimene agriculture. The "northern" type of the Bemba involves the making of large woodland clearings during the early months of the dry season. The crowns of the trees are lopped, leaving the trunks standing. The timber is stacked in circles and fired shortly before the rains. Millet, sorghum, and other crops are planted in the fertile ash. 'Chitimene' therefore requires large land areas comparatively sparsely populated to enable old gardens to regenerate before the cycle returns to its starting point. Villages are in effect continually moving and no population map could show the actual disposition of settlement at any one time. Attempts to rationalise this system have been made: a "corridor garden" may be demarcated on fertile soils and divided into seven or more blocks and the cultivator then cultivates each garden for three or more years returning to the first plot after a full regenerative cycle is complete.

of bigger chiefdoms to the north of the devastated areas but inside the existing reserves. Average yields on established farms have risen to 1080 pounds of maize per acre which sold in 1960 at 6 shillings a hundred pounds. Groundnuts averaged 520 pounds per acre after three years farming and were selling at 33 shillings a hundred pounds. Average incomes vary with the farmers and their soil. In one chiefdom third year farmers were averaging £75 a year but the mean for Ngoniland lay between £20 and £30 for 1960; such farmers were also supporting their families from the land. Established farmers in the new resettlement area of Chipangali averaged £96 in 1960. Individual farmers in the new village lands there earned about £37 by their third year (Fig. 5). Overall the most popular cash crop with peasant farmers is groundnuts but an increasing number experimented with tobacco. Eighty acres of Burley tobacco made a net sale of £43 per acre in 1960 and 37 acres of Turkish brought in £26 an acre.

In relation to the existing conditions in the old lands the advantages of peasant farming are numerous but the critical period is that when the government loan for land clearance, oxen and implements is being repaid. Farmers are bound to follow advice from the Agricultural Department and the unsuccessful or unco-operative person may be evicted or leave voluntarily. Stumping charges for land clearance may be as high as £6 an acre with African labour, and are counted as

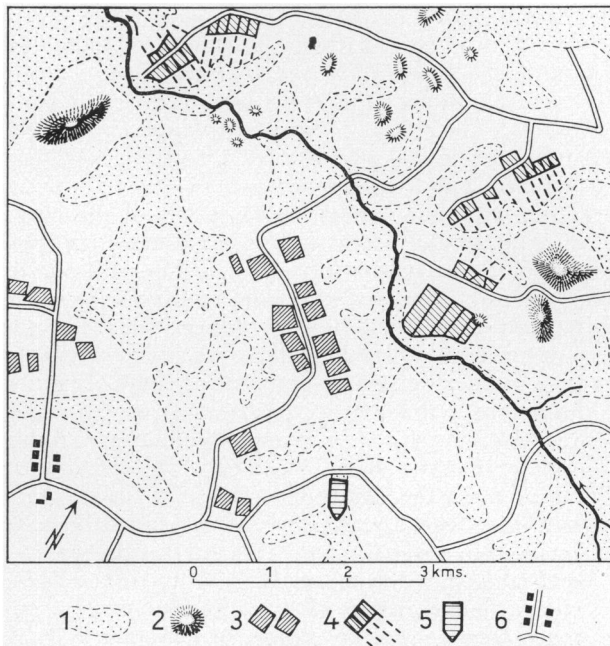


Fig. 5:

Land utilisation in Ngoni Resettlement Areas (Chipangali)

1. dambo
2. granitic "kopje"
3. peasant farms
4. improved village farms
5. irrigation dam
6. settlement nucleus (stores, school, etc.).

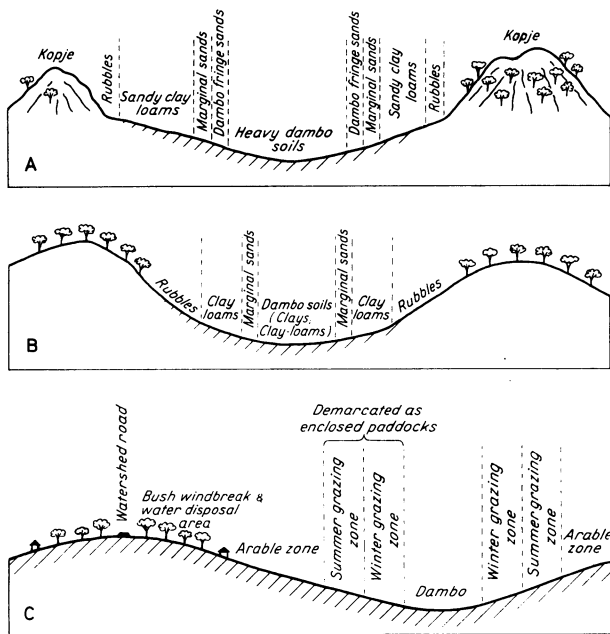


Fig. 4:

- (A) Soil catena in plateau (sandvelt) areas.
- (B) Soil catena in metamorphic areas.
- (C) Idealised land utilisation in peasant farming areas.

part of the loan. Initially nine acres, extending to fifteen, are stumped for each farmer. The farm unit is usually of about 120 acres and allows for bush and dambo grazing, comprising the various soils which slope from the watershed to the dambo (Fig.4 [C]). The new farmer is thus installed with approximately £260 capital and this has to be repaid over ten years. Such work is hard and hand labour may not be able to clear the bush at the desired rate of farm extension. Experiments have been made with bulldozers which can clear at an optimum rate of one acre an hour but the economical charge is probably far above that for traditional methods. Only a government agency can afford to temper development planning with an understanding of local needs, but the national peasant farming scheme is intended to be self financing eventually as a "revolving" fund. Repayments can only keep up the momentum under successful cash cropping and marketing, and the failed farmers jeopardize the theoretical benefits whereby the industry of these village pioneers could snowball into the higher living standard needed by the remainder.

The extent to which peasant farming will expand in the future is uncertain but there is a clear

income ceiling related to the present size of farms. It will not necessarily be possible to further expand the sales of tropical crops on the world market although this expansion to date has made possible the initial phase of development. Developing internal markets offer a possible long term solution but these are geared to the rate of urbanization in Northern Rhodesia and the introduction of incentives to seek cash amongst rural populations. In the Ngoni area there are several primary co-operative societies which buy from the peasant farmer and villager. In turn these societies are served by district and provincial co-operative and marketing unions. At present these organizations are mainly collecting points for crop sales but in time they may extend their services to the supply of agricultural machinery and other farm supplies. In the Congo the idea of a "centre agricole" or "agrotown" has been advanced by their establishment in certain areas as a nucleus of a mechanized group of small farm units employing the pooled resources of a marketing, supply, and machinery centre. In Northern Rhodesia it is already recognized that the further broadening of the economy devolves upon integration of farms, market outlets, costing, crop processing and the sociological factor of adjusting old traditions to modern conditions. During the post war years there were over 250 European farmers in the Fort Jameson district but the falling away of the tobacco boom has reduced their number to little more than a tenth. This experience has tempered optimism but there is a greater faith in the individual peasant farm than the communal alternatives where it must remain apart from plantations on the one hand and collectives on the other.

Stock Reduction: Difficulties in the social attitude of the Ngoni towards cattle have so far precluded complete adoption of the practice of cash cropping herds. In recent years several cattle markets have been sited in a number of chiefdoms but sales have been small. Potentially there is a good market for meat in Nyasaland with its dense population and cattle shortage. Transport is by road to Salima and thence by rail to Blantyre where the government backed Cold Storage Commission operates. Apart from the needs of the local butcheries in Fort Jameson, about 700 beasts were exported to Nyasaland in 1960. There is some hope that the Cold Storage Commission will commence operations in Fort Jameson itself and future trends in the meat trade have been foreshadowed in the report of the Special Commissioner who was appointed in 1955 to investigate Agro Economic Recovery and Development in the Eastern Province (HOBDA, 1956). (The present take-off on herds is about 2% com-

pared with 10—14% for commercially managed herds.)

P. BROWN has outlined the problems and solutions involved in destocking in the Nandi district of Kenya and the similarities of the overall problem to those in the Ngoni area interesting (BROWN, 1958). The suggestions involved introducing by-laws which would limit stocking to the optimum carrying capacity speeding up the physical enclosure of the land, and apart from the streamlining of the marketing system, convincing the people that the stock reduction would be financially beneficial. The enormity of the task was admitted and the necessity of enclosure possibly entailing legalized land tenure in the Nandi region has equal application to the Ngoni region. Under the "Kamanaganik" system of farming-out stock in parts of Kenya, or in the Ngoni communal grazing, the severity of the problem is not evident to the individual.

Changes in Land Tenure. Any question of land tenure is fundamentally linked with most of the foregoing features of future economic development in Ngoniland. A small body of progressive farmers is already aware that investment of hard work and money on farmland requires some form of guarantee that the usufructuary right will not grow weaker as demographic pressure increases. The Government is aware of the stimulation which agricultural and commercial schemes sponsored by governments in several territories have given to the desire for land tenure by individual grant. C. WHITE has outlined the features of customary tenure in Northern Rhodesia and the extent to which registered individual titles could usefully be introduced (WHITE, 1959—60). In his "Land law and custom in the Colonies", C. MEEK noted that "*the conditions under which land is held are of far reaching importance for the development of agriculture. If land is plentiful and the people are still content with a subsistence economy, then it is possible to practice a system of shifting cultivation without any damage to the land, and without the necessity of imposing rigid rules of tenure. But where the population becomes denser, or for some reason there is a marked increase in the area of cultivated land it may become necessary to devise more settled systems of holding land*" (MEEK, 1946). Instead of summarizing the general colonial pattern this might have been written to summarize Ngoni conditions. Although the commercialization of the land and the ability of sons to inherit, are themselves necessary adjuncts for continued advance, an equitable solution has to be found which will allow these essentially alien practices to be introduced without causing the dissolution of the social

security inherent in the tribal system and customary law. Peasant Farmers who at some stage sign such agreements in order to register individual title will be the first to break with the community concept of the land as permanently reserved for the tribal body on a basis of communal land tenure. This will be symptomatic of a break through in agriculture demanded by land hunger in Ngoniland.

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BERICHTE UND KLEINE MITTEILUNGEN

DIE GEOMORPHOLOGIE DER KÜSTENGEBIETE DER OSTSEE VON SCHLESWIG-HOLSTEIN BIS POMMERN

Ein Literaturbericht

WERNER WITT

Daß an den deutschen Universitäten im südlichen Ostseeraum von jeher küstenmorphologische Studien eine besondere Bedeutung gehabt haben, ergibt sich aus der Lage der Hochschulen zum Meer fast zwangsläufig. Mit Fragen der regionalen Küstenmorphologie befaßten sich zunächst fast ausschließlich die geographischen Institute, und insbesondere aus dem Greifswalder und dem Kieler Institut ist im Laufe des letzten halben Jahrhunderts eine große Zahl bemerkenswerter Arbeiten hervorgegangen. Nur an die wichtigsten dieser älteren Arbeiten sei hier erinnert, weil sich aus ihrer Kenntnis die Entwicklung der küstenmorphologischen Forschung in den letzten Jahrzehnten, ihre gegenwärtige Situation und insbesondere die veränderte Stel-

lung der Geographie in ihr am besten beurteilen läßt. Sie unterscheidet sich von der alten geographisch-morphologischen Betrachtungsweise sowohl hinsichtlich der vertieften Zielsetzung, die heute bis zu dem Bemühen um eine mathematische Formulierung des Ablaufes der Prozesse und der Veränderungen in der Küstenzone geht, und hinsichtlich der veränderten Methoden als auch durch die weitgehende Verlagerung der Forschung von der umfassenderen, aber allgemeineren Betrachtungsweise der Geographie auf Spezialwissenschaften, insbesondere die Geologie, Geophysik, Hydrologie, Meereskunde und auf die wasserwirtschaftlichen und wasserbautechnischen Fachdienststellen, denen der Küstenschutz obliegt.

Gegenüber der Spezialisierung auf der einen Seite zeichnet sich die Notwendigkeit einer Zusammenarbeit der verschiedenen Fachrichtungen ab. Auf beiden Seiten der Zonengrenze gibt es neben den wissenschaftlichen Forschungseinrichtungen die „Küstenausschüsse“ (den „Küstenausschuß Nord- und Ostsee“ in der Bundesrepublik Deutschland mit einer eigenen Zeitschrift „Die