

1937

38184

38184

CO 533/483
KENYA

SOIL SECTION

PRESERVATION & EXTENSION OF FOREST RESOURCES.

Previous

1936

Subsequent

1938

R. 297

2/5/37

R. 297

29/6/37

R. 309

R. 297

15/7

R. 309

16/7

M. Ashin

19/7

22/11/37

D. Tompany

AD

R. 297

Handwritten notes:
Fang...
140/37...
with Mr. Flood
...
21/5/37

Perhaps the most interesting point brought out in the reply to the Secretariat Circular letter of the 30th of March, 1936, is that the part played by cattle in assisting erosion is at present no so much one of overgrazing or overstocking as of gullying. It is said that there is practically no overstocking in the terms of acres per beast, but that water supplies are so poorly distributed as to concentrate grazing in certain limited areas. A more widely distributed system of watering places for stock would enable control to be exercised and rotational grazing, permitting the grass to seed, to be introduced. It is contemplated in Masai, Machakos and Kitui and on the Yatta, and is one of the purposes for which the £40,000 grant from the Colonial Development Fund has been made. "There seems to be no doubt that in areas that were grossly overstocked in 1930, drought and locusts have combined to redress the balance."

Combative measures against soil erosion are being taken over a wide area. In various districts in the Central, Coast and Rift Valley Provinces headmen have been empowered to order:

Contour planting of napier grass.

The digging of trenches on steep slopes in areas liable to erosion.

The prohibition of cultivation in the immediate neighbourhood of springs, gullies, roads or streams.

The planting of grass on bare fallows.

The demarcation of hedges of stock routes with a view to preventing gully formation, &

Generally for the adoption of anti-wash measures such as terracing and contour planting of crops and trees which can be carried out during cultivation

In all districts including non-native areas and those native areas in which orders have not actually been issued under the Native Authority Ordinance, the dangers of erosion are being continuously brought home to the people both by propaganda and by a growing realisation that the work now being done is insufficient.

In accordance with the recommendation of the Standing Board of Economic Development an officer of the Agricultural Department is now engaged on a survey of the Colony with a view to correlating the demands and need for re-conditioning and protective measures in the various districts in order of priority.

We shall, no doubt, hear more from the Governor when the Agricultural Officer in question has reported.

Acknowledge and put by *Air F.*
Stockdale to see

C. F. ...
27/5

Mr. Parker who is on leave until next Monday might like to see this on his return.

S. M. Campbell
27.5

The enclosure to (1) sets out the position in Kenya, and whilst admitting that much has been done during the past few years, very much more will have to be done during the next five years if the ruination of considerable areas of the Colony

Colony is to be avoided. I am making special reference to this in my report on Kenya which I hope to have completed during the next two weeks. There is a very great necessity for the expenditure of considerably larger sums than have been available in the past, and additional funds from the Central Government will be very necessary. In the past few years, owing to the financial depression, only small amounts could be found for anti-erosion measures. Many of the so-called demonstrations by the Dept. of Agriculture in native reserves are pathetic. As a measure against the erosion problem in those reserves they are about as effective as attempting to build a bridge across Sydney harbour with a Meccano set!

I was impressed with the work of one reconditioning officer (Mr. Landridge). He had made several very obvious mistakes, but he was most anxious to learn and I hope that I was able to help him. He had, however, with very meagre funds, been able to recondition nearly 20,000 acres in the Kamasia reserve. I also saw the report of Mr. Maher - a very good young agricultural officer - on the Ukamba reserve. This report was intended for the Standing Board of Economic Development and I explained to the Chairman of this Board (Mr. Logan) in what respects this report was lacking in what was required before definite conclusions could be reached and appropriate measures decided upon. To attempt to indicate what should be done in the Ukamba reserve within a fortnight was absurd. No account was given of the topography of the country, of the several catchment areas, drainage, etc., and no account was taken of the administration difficulties which faced those who attempted to take action along the lines

lines suggested. I impressed on Mr. Logan that soil erosion was a problem for all - Administration, Forests, Veterinary, Agriculture, etc. Much of Mr. Maher's report could not possibly be accepted by the Administration, and what the Board of Economic Development require are, con-joint reports showing what action was necessary, how it could be carried out and the order in which the several measures should proceed. To recommend, for example, that all goats should be removed from the reserve within 3 years and to order that lands with definite degrees of slope should be used only for specified pur-poses, was of little use. Such recommendations could be made from an arm-chair; but they clearly showed that the individual responsible was not familiar with the practice of anti-erosion measures.

I feel very definitely that what is wanted in Kenya is more knowledge on the practical side of the problem. Kenya can learn from Tanganyika, where some good work has been done. Will it be prepared to do so? Mr. Langridge should go to Kautland to see what has actually been done there, and Mr. Maher, if he is to be the Soil Erosion officer, should be sent to America to see how soil erosion projects are tackled.

If this is not done, many mistakes will be made and much money wasted, and Kenya cannot afford to waste money on this matter. It will
require

require to spend, I estimate, £25,000 per annum for the next five years on anti-erosion measures, and another £25,000 a year for a similar period on the development of better systems of agriculture. It is useless to go in for anti-erosion measures and re- conditioning of reserves unless there are at the same time changes of methods of agriculture and stock management. Otherwise, the position 5-10 years after the works have been completed will be just as bad again, and the money will have been wasted. I entirely agree that the water development programme is the first most important problem to tackle, and it is pleasing to me to see that it is now recognised that faulty agricultural methods are as much responsible in Kenya for soil erosion as overstocking. This was pointed out during my last visit to Kenya and was then very acceptable. Further experience, such as it has been with a drive for the development of economic crops in many places where they should not have been introduced, has clearly demonstrated that overstocking alone is not the trouble. Pastoral tribes have been increasing their agriculture - often without guidance - and disaster is following these efforts.

Many settlers have done some good work and the Agricultural Bank has helped. The settlers' problem is mainly finance, as stated in these papers, and the Kenya Farmers' Association approached me with a re- quest that a C.D.F. loan should be secured for obtain- ing soil erosion tackle for operation on a co-opera- tive basis. The American system of graders or ditches drawn by tractor is quite suitable for the plain lands occupied by the settlers in the highlands

*We propose to visit the
Larangey valley and
Sheep in the*

of Kenya, but there, as in America, it is essential that anti-soil erosion projects should be worked on a co-operative rather than on an individual basis. The natural configuration of the land must be considered, and it is useless for one farmer to terrace his land if by so doing he merely throws the water on to the lands of his neighbour.

F. A. Stockdale
9.6.37.

The enclosure to this despatch shows the result of the replies received to the Circular letter which will be found in No. 13 on the 1936 paper. The position as set out in Sir F. Stockdale's minute is indeed serious, the most serious point being that large expenditure will have to be contemplated if anything good is to be done. There is no use in half-measures in a thing of this kind. The expenditure will have to be faced and as a good deal of it will be done in native areas, the fact will have to be recognised that this expenditure is for the good of the whole place and not only for the natives. If the native reserves and native lands generally are allowed to get eroded, then the European areas will follow suit and nothing can stop them. It is therefore necessary to consider the whole place as one unit and adopt comprehensive plans to deal with it.

The work of Mr. Landridge has been commented upon in favourable terms in recent reports. Mr. Maher is now about to be seconded

seconded to attack soil erosion generally over the whole Colony. What Sir F. Stockdale says, that erosion is a problem for everybody, is, of course, an obvious fact, but it is not always realised, though Mr. Wade's letter to me of November last says that all departments were doing their utmost to do their own (and everybody else's) business in regard to erosion. I think, then, that it might be a good thing to send a despatch to Kenya now, if Sir F. Stockdale agrees, on the lines of the attached draft. The Secretary of State will no doubt be interested to see.

J. A. K. W.

15.6.1937

As Sir F. Stockdale has agreed the draft I am sure that he does not think that it is necessary to anticipate his report. There will be no doubt to know the said then the report is ready.

It will be a great step forward if this question is taken up seriously in Kenya - I only wish Sir F. Stockdale were available to push it through.

W. A. H. 27

Jan 9.37

18.6.37

2/20 Kenya - Conf(2) - (1/ansd)

27/6/37

A useful piece of propaganda.
Put by.

(The spare copy might be placed on the Kenya Action Society file - There were 100 last year)

This is the file
No. 297
146

(R. 2000 with 16/7/2)

J.P. Ramin
19/7

J.C.A. Reed
19/7

H. [unclear]
20/7

PARLIAMENTARY QUESTION BY MR. MATHERS, FOR ORAL REPLY ON
25/7/27 (2000 19/7/27)

[Handwritten signature]

P.Q. BY MR. PIERCE, FOR ORAL REPLY ON 2/8/27
(see p. 9/11)

[Handwritten signature]

(1)

General

Major & Mrs Waid are
 two fairly influential
 settlers. They have
 recently seen Sir P
 Stockdale. They are
 pleasant people who
 frequently attach to in
 the colony. Their visit
 today will have served
 its purpose if they are
 allowed to give free vent
 to their feelings & no more.

(2)

Two points are likely to be raised.

(1) Not enough is being done about soil erosion.

Answer - Successful attempts have been made & are continuing to raise native interest in the matter. We are doing all we can here & everything put up by the Govt. receives sympathetic consideration.

(2) Grass fires & their

8
(3)

Control : Kenya ought to follow example of Southern Rhodesia in preventative measures.

Answer : We have heard nothing yet from Kenya & will give full attention to what is said.

Ans (not for repetition) The Southern Rhodesian measures appear to have been only partially successful.

9
3
KENYA ARBOR SOCIETY.

Aims: *To Protect Forests*
To Encourage Tree-Planting.
To Conserve Soil and Water.

PATRONS—
SIR JOSEPH BYRNE,
G.C.M.G., K.C.B., C.B.
H.E. SIR ROBERT BROOKE-POPHAM,
G.C.V.O., K.C.B., C.M.G., D.S.O.

HON. GENERAL SECRETARY,
MAJOR E. H. WARD,
P. O. Box 3.

NAIVASHA.

PRESIDENT—
F. LODGE, Esq., C.I.E., J.P.

Read pl R

*For the information of the East African
Department—*

*With the Compliments of the
Hon. General Secretary.*

10

THE KENYA ARBOR SOCIETY.

DESERTS IN THE MAKING.

A Study in the Causes and effects
of Soil Erosion.

By R. WARD.

Printed by
THE EAST AFRICAN STANDARD Ltd.
NAIROBI.



" Some European farmers protect the cover on the banks of
streams " (p. 13).

I.
WHAT IS EROSION

History, and unless the evidence has been misread, pre-history also, is bound up with man's misuses of the natural resources of the world he inhabits, and above all, of his misuse of the land. The land, in this sense, means those few inches of topsoil which alone can support the plant-life which in its turn nourishes both man and beast, the plant-life which is not only of intrinsic value as food, but which is the chief natural reservoir of those water-supplies without which no settled life, no civilisation, is possible. Let the topsoil be removed, and let the water-holding capacity of the ground be lost, and you have a desert. It is true that the forces of nature, sun, and wind and rain, are always at work, chiselling the rocks, carving out the water-courses; in this sense, erosion is a natural and inevitable process. But the process is an unimaginably slow one, and, at the same time, new soil is being made out of disintegrating rock and rotting vegetation. Without the interference of man, the process is one of gradual change but not of loss of fertility. The forests, untouched by man, store the water in the root-systems of their trees and in the litter on the forest floor, and give it out again slowly to feed the streams and springs, so that floods are prevented and droughts are mitigated. Forests too, on steep slopes, are the natural means of checking loss of soil as well as of water. Grass, where man does not interfere, makes the soil preventing desiccation and the consequent removal of topsoil by the wind. Thus, water and soil are conserved, and a balance between soil-loss and soil-building is maintained.

But when man comes upon the scene, the balance is disturbed, and Nature is no longer allowed to build as quickly as she demolishes. Flocks and herds of domestic animals, among whom the man is the chief culprit, devour the pastures and bare them to the forces of erosion; fires rage across grassland, and through bush and forest, impartially; and cultivation is carried out at the forest's expense, thus, slowly perhaps, but very surely, the earth is shorn of its protecting covering, the water table sinks, the land becomes more and more arid, and at last the once-fertile country has become a sterile wilderness. Primitive man moves on to seek fresh pastures, and leaves his deserts behind him, or perhaps moves among them, a nomad seeking the scanty pastures in the valleys and near the wells. But settled, civilised man cannot move on; his social organisation has become too complex, and so, when he has exhausted the fertility of the land by overgrazing, by destruction of forest, and by faulty methods of agriculture, he and his cities have perished by the forces of destruction he himself has unleashed; flood, and drought, and slow starvation. This, at least, is the story suggested by the buried cities of Asia, Africa, and South America. Why does Susa, the palace of Darius, stand to-day surrounded by a desert? An answer can perhaps be found in the barren hills of Persia, hills which were once clothed with forest, and which thus fed and maintained a plentiful water-supply to irrigate and fertilise the land. In North Africa, it is probable that denudation and desiccation played the same role, and that man's misuse of the land has brought about its inevitable punishment.

It may be argued that there is no proof that ancient civilisations decayed through their misuse of land; it must be a matter of supposition. But anyone who takes the trouble to trace the sequence of cause and effect in the history of the misuse of land in the United States of America, is bound to admit that the supposition is well founded. As colonisation flowed westwards across America, the forests fell before the lumbermen's axes, and the grasslands which protected the soil of the central plains were broken by the plough, grasslands which were not measured by acres, but by thousands of square miles. Both forests and grasslands offered the promise of illimitable wealth, the first in timber, the second in wheat, and so the saw-mills and the threshing machines continued to devour the long-stored fertility of America.

Then Nature began to take her revenge. The rain rushed off the denuded mountain slopes, and in the lower valleys there were floods, destructive and disastrous beyond imagination to picture; each flood more destructive and disastrous than the last, costing millions of money, and an immeasurable amount in distress and misery. Defensive measures, which had at first the object of confining the greatest river, the Mississippi, were undertaken, but were, and by their nature always must be, useless in the worst crises. The walls which were to imprison the waters of the river, only succeeded in raising its bed, for the silt which before the levees, as they are called, were built, used to be spread over the river-beds when the river rose, now remained to build up the river-bed; thus the river-bed and the levees grew together, and the force of the current, confined in a channel, became ever greater, with higher potentialities for destruction. The irresistible force met, from time to time, the immovable object, and in this case there was no doubt which of the two came off best. The Mississippi, periodically bursting its man-made bounds, spread ruin and terror for hundreds of miles across America.

In the central plain, the sun and the wind had their way with the unprotected soil; crop-yields became poorer and poorer till finally, in many districts, there was no yield at all, and the once rich corn-lands had become a wilderness of dust, dust which when the strong westerly winds blow rose in dark and stifling clouds which travelled across the continent, darkening the skies above distant cities, and filling their streets with its choking particles.

These are the terrible punishments visited on those peoples who maltreat their land. Perhaps these pictures may seem melodramatic, exaggerated. That they are neither, statistics may be called upon to prove.

413,000,000 acres have been under cultivation in the U.S.A.

Of these,

100,000,000 (or nearly a quarter) have been irrevocably ruined.

125,000,000 have been seriously damaged.

100,000,000 are threatened.

In other words, OVER THREE-QUARTERS of the once cultivated area of the United States have been affected.

The State, in its function of Resettlement Administration has purchased 10,000,000 acres of damaged land, and has moved many of the inhabitants to other farms, at a cost to the nation of about £20,000,000.

During the summer of 1934, the Government bought and slaughtered 7,000,000 cattle and 5,000,000 sheep for whom there was no food.

The recent flood in the Mississippi basin has already destroyed 350,000,000 dollars worth of property, 750,000 people are homeless, and an appeal for a relief fund of 4,000,000 dollars has been issued.

The dust storm of May 11th, 1934 swept away 300,000,000 tons of fertile topsoil from the prairies, eastward across the States, and far out over the Atlantic.

During the last 40 or 50 years 11 out of 13 reservoirs in the Deep River district of North Carolina have become "entirely filled with the products of erosion." The reservoir at Austin, Texas, filled with sediment to 85% of its capacity in 20 years. If the increasing rate of reservoir filling is not soon brought under control, the irrigation civilisation of the West is doomed. (From a pamphlet published by the Forest Preserve Association of New York.)

A FEW MORE FACTS AND FIGURES.

It is not only America which has suffered disastrously from the effects of the misuse of land.

In Australia it is said that, "Soil wastage and its attendant evils are becoming serious problem in the more thickly-populated parts of Australia."
"Since the forest has been destroyed in the mountainous districts of Victoria, many holdings have had to be abandoned."

At Yallourn, where the coal mines and works of the State Electricity Commission are situated, a flood swept away the protection walls and within a few hours damage to the extent of £200,000 had been caused.

In the Punjab, in India,
"One thousand villages have been affected, and the prosperity of the inhabitants seriously reduced. . . the annual loss in land revenue is considerable."

In South Africa,
"Enormous tracts have been entirely and partially denuded of their original vegetation, with the result that streams, springs, vleis, and water-holes, have dried up or disappeared."

In China,
"There is extensive run-off from the deforested hill regions followed by floods from great rivers. The latter dry periods may be extended into three-fourths of the year and terrible famines have been known

frequently in forty centuries of history. As many as two million people in one year have been known to have perished from famine due to long droughts followed by sudden floods. Rain storms of twenty inches in two days may suddenly fall in the mountain regions and the run-off reaches the rivers in the vast plains. Protected by age-old dykes as they may be they are often incapable of holding the sudden floods and inundations may cover as much as 5,000 square miles with complete destruction of the growing crops."

A study of these fact and figures must convince, one would imagine, even the most sceptical, that the perils of erosion are not exaggerated.

IN KENYA.

The history of soil erosion in Kenya goes back a long way before the British occupation. The agricultural tribes practised "shifting cultivation," clearing and burning patches of forest to grow their crops, and then, when the soil was exhausted, moving on and repeating the process elsewhere. The pastoral tribes congregated their herds near watering-places in the dry weather, overgrazing and over-trampling the ground and thus starting both gullying, and sheet erosion—the general lowering of the level of the topsoil.

But the natural checks on the population, both human and animal, by war, famine, and disease, did not allow the process to be a very rapid one. When the British came, and imposed peace and order, relieved famine, and to a great extent, prevented disease, the process of erosion was accelerated. The settlers themselves were not free from blame, for forest untouched before was cleared for cultivation—the legend had grown up of the "inexhaustible fertility" of the red forest soil. The most wholesale destroyers of the forest were, however, the Kikuyu tribe. As early as 1909, we hear of the Forest behind Fort Hall vanishing at the rate of half-a-mile a year, and forest-destruction on this scale continued until the Forest Department brought the chief remaining forest areas of Kenya under its control. Even then, forest destruction was checked, but not ended. It still continued; in the Forest Reserves by fire; on private land chiefly by the activities of Kikuyu "squatters" who were (and all too often are) allowed to clear and destroy forest to make their shambas; and in the Native Reserves by every method of destruction. Kenya cannot afford to lose another tree from her forests, for her proportion of forest to total land area, 2.75 per cent., is, for climatic and water-conservation purposes alone, dangerously low. Countries such as Norway, Germany and Switzerland, situated in the temperate zone, with humid atmosphere, maintain proportions of more than 20 per cent.

In the pastoral reserves, animal populations increased enormously and when statistics were compiled in 1931, it was found that the cattle alone had increased, since 1920, from 3 to 6 million, a number far in excess of that which the land could support without deterioration. Annual grass-burning assisted this deterioration, and hastened the



" Kikuyu squatters . . . clear and destroy forest to make their shambas " (p. 7).



" Native agriculture is practised on . . . steep hillsides, very susceptible to erosion " (p. 9).

process of desiccation and erosion. The Kamba, the Suk, the Kamasia, the Njemps and the Masai alike suffered severely.

In the agricultural reserves, production, though Government encouragement, became more intensive. The land suffered, for little or nothing was done to conserve soil or water, and the Government policy of growing crops for export resulted in an increase of the amount of land under cultivation, and a proportionate increase of erosion. Native agriculture in Kenya is practised to a very great extent on land cut up into a series of narrow ridges, a land of steep hillsides and narrow valleys, very susceptible to erosion. It is essential therefore, to take precautions, by terracing or by strip-cropping, if production is to be maintained, let alone increased. At this late hour this fact is beginning to be realised, but there is much leeway to be made up.

A STREAM OF WARNINGS.

Ever since 1909, when Sir David Hutchins made a report on the forests of Kenya, and stressed the necessity for preserving them as a defence against erosion, a succession of Commissions, administrators, forestry and agricultural experts, and during the last two years, the Kenya Arbor Society, have been urging upon Government the necessity for taking energetic action if the fertility of Kenya's soil—which is Kenya's wealth—is not to be irrevocably lost.

There have been a steady stream of warnings.

Professor R. S. Troup, C.I.E., in his " Report on Forestry in Kenya Colony," 1922, said—

" That limit (the utmost limit of safety) has already been exceeded in respect of the destruction of forest on which the maintenance of the water supply depends. . . the forests of Kenya Colony, situated as they are for the most part on hilly country, exercise an important, not to say a vital influence on the general prosperity of the Colony."

" The East African Commission (The Right Hon. W. Ormsby-Cole, M.P., Major A. G. Church, D.S.O., M.P., Mr. F. C. Lindfield, M.P.) said, in 1925.

" There is a real danger in East Africa lest pastoral tribes should stagnate and lest the actual fertility of the soil should deteriorate by overstocking. Cases were brought to our notice, particularly in the case of the Wakamba in Kenya, of a definitely retrogressive tendency due to the rapid increase of native stock, accompanied by land previously cultivated going out of cultivation."

The Kenya Agricultural Commission (Chairman, Sir Daniel Hall) reported in 1929:—

" A journey through the east area (of the Ukamba Reserve) reveals that over large stretches of hillsides vegetation has been almost

wholly removed. The soil has been eroded down to the sub-soil and its removal will continue at an ever increasing rate.

"It is not too much to say that a desert has already been created where grazing formerly was good."

Report of the Kenya Land Commission, (Chairman, Sir Morris Carter) September, 1933.

"The Kamba of Machakos district are suffering from reckless overstocking in the past. . . Their reserve has deteriorated to such an extent, that, until it has been reconditioned, it cannot carry even the numbers which the people might reasonably require. . . (Para 1414).

"When we turn to the reserves of the Suk, the Njemps, and the Samburu, the position is one of almost unrelieved gloom. The people . . . devote their lives to amassing vast herds of uneconomic livestock, which are fast turning their country into a desert. . . (Para 1418).

"Districts such as Kamasia have become so devastated as to create the fear that the population will not be able to maintain itself even at its existing density, and, since the process is cumulative in its effect, may ultimately be threatened with extinction. The imperative necessity for a policy and programme of reconditioning, which must include the reduction of livestock, is therefore obvious. . . (Para 1431).

This problem is the direct result of British rule, and it is therefore an obligation on Government to face and devise adequate remedies. It is definitely not a problem which can be solved by an increase of land. If the uncontrolled increase of stock be permitted to continue, then the whole of Africa would be insufficient to satisfy the wants of the future. . . (Para 1480).

"Probably in about 1920, the main stock areas of the native reserves had attained their optimum carrying capacity, and, although fully stocked, were not overstocked. (Number of cattle in 1920, 3,000,000.) Since then the cattle population has increased to about 6,000,000, or, roughly speaking doubled itself in the last 12 years. (Para 1487)."

Report of the Commission to Enquire into the Financial Position and System of Taxation in Kenya. Sir Alan Pim, July 1936.

Colonial No. 116.

"It is acknowledged on all sides that the real problem for the future lies in the preservation and maintenance of soil fertility alike in the pastoral and agricultural areas. In the former the question is mainly one of reconditioning eroded lands and the prevention of further damage from that source. It is a problem common to most parts of Africa, and ultimately resolves itself into control of grazing. . .

"The position in some of the agricultural areas is scarcely less serious. . . "Sheet" erosion is all too prevalent and will tend to increase rather than to diminish. Remedial measures are being taken in some areas, but there exists a danger of the question being relegated to one



"Goats those arch-desert makers" (p. 14).



"Districts such as Kamasia have become so devastated" (p. 10).

of secondary importance owing to the efforts, at present being made towards an increase of area under native grown crops." (Page 242.)

These are grave warnings, weighty opinions, and that they have been, almost wholly, disregarded, is a slur on British administration, self-appointed as the trustee of the native peoples.

EROSION IN THE SETTLED AREAS.

In the settled areas, denudation and erosion are less serious and less widespread than in the native reserves, but they are far from negligible. Kikuyu squatters are one of the chief agents of denudation, destroying forest, clearing bush and cultivating on steep slopes. Springs dry up, the flow of streams is diminished, and permanent streams become seasonal. This is a serious matter: Kenya, except for a few favoured districts, is not well watered, and the conservation of the little water there is, is of paramount importance.

The present condition of the escarpments which form the sides of the Rift Valley show what harm can be done by squatters and their stock. Not many years ago these steep scarps were covered with dense forest, but now they have been stripped of all cover except a few scattered trees, some straggly bushes, and a little thin grass. Goats and shambas are found everywhere, and the shambas are seldom in the same place for long, as there is so little soil left on the hillside that fertility is soon exhausted; the shamba is abandoned and soon completes the removal of forest that denudation had begun. The process of depletion is going on all the time, and before long the sides of the Rift Valley, in the settled districts, will be composed of little but subsoil and rock.

Goats are everywhere specially pernicious, as they prevent natural regeneration of trees and bush, and give the denuded land no chance to recollect itself.

In the pastoral districts, both sheet erosion and gullying are common. The first is caused very largely by squatter stock, and the second by driving large herds of stock, European and native-owned, to water; tracks are worn deeper and deeper, and gullies are formed. Examples of both types of erosion may be seen in the Naivasha district, and in North Kenya.

Fires, often started by squatters, or by wandering natives, do much damage every year. Not only is valuable water-conserving forest and bush destroyed, but by the burning of grass, the ground is stripped of its protecting cover, and the onset of desiccation and erosion is hastened. Fires, there is no doubt, are an important contributory cause of the increased general aridity of large tracts of the Colony.

In agricultural districts, there are still many farmers who take no precautions against soil loss; who do not practice "strip-cropping," "contour-ploughing," or "terracing," and loss of fertility and declining crop yields are the result of this neglect.

On many farms, roads are made without proper drainage, and turn by degrees into gullies.

Erosion, it is clear, is not a problem confined to native reserves.

The Present Situation.

What is being done?

The competent authorities are all agreed that the state of much of the land in Kenya to-day is a very serious one; it has been gravely misused, and misuse is bringing its own punishment in decrease of fertility and the social and economic problem which such decrease brings in its train. It is surely the duty of everyone who lives in Kenya, to enquire what, if anything, is being done to improve matters, and to help bring the pressure of public opinion to bear to hasten effective action.

It can be said at the outset, that little is being done; either to extend the forest area of the Colony, to conserve water, to prevent further soil erosion, or to repair the damage done in the past. It is true that successful "Reconditioning" is being carried out in the Kamasia and Uluamba Reserves, but only on a very small, and totally inadequate scale; in the Kamasia, for instance, less than 2 per cent. has been dealt with in 6 years.

Terracing is demonstrated and encouraged in the agricultural reserves; the sale of stock to Liebig's newly established meat factory will also be encouraged. Some administrative and all Agricultural Officers carry on continuous propaganda about forest, soil and water conservation, and the subjects are taught and demonstrated in African schools. Some Africans have learnt the practice and value of strip-cropping and terracing and of tree-planting, and a few even are beginning to think that the goat is not the best form of currency.

Some European farmers, but not yet the majority, realise, that soil and water conservation is the basis of all good farming, and protect the cover on the banks of streams, regulate grazing, and never cultivate without taking the appropriate measures to prevent erosion.

A little over two years ago the Kenya Arbor Society was started, and is growing steadily, and officials and settlers work together in it for the furtherance of the Society's aims; the protection of forests and water-supplies, the encouragement of tree-planting, and of all other measures to fight soil erosion.

But an account of "What is being done" is unfortunately a very short one.

What Needs Doing.

If everyone in Kenya, both in town and country, knew what erosion was, and how vast were its potentialities for harm, it is safe to say that a newer and wiser form of "land conservation" would everywhere be practised. Therefore EDUCATION in land conservation is needed; it might well be a school subject, and one which no

age of any age should scorn to study, for it is of vital importance to everybody. For if there is little soil and less water, in the Highlands of Kenya, it is obvious that it will not only be the farmer who will suffer. If public opinion demanded protection of forests in the interests of climate and water-conservation as well as of timber-production, LEGISLATION would follow, and all forests which protect water-supplies would be proclaimed "Protection Forests," never to be thinned or cleared. And some form of "Land Conservation Ordinance" would prevent forests on private land from being ruthlessly destroyed, and would prohibit actions which cause soil erosion, or diminution of water-supplies. Overstocking would be a thing of the past, for stock, in all areas, would be limited to such numbers as the land could carry without harm to pasture, soil, or water-supplies. GOATS would soon vanish, for public opinion would demand that these arch-desert-makers should be eliminated.

No farmer would tolerate them on his land, and in the Native Reserves such measures would be taken as would ensure the virtual disappearance of the pest within a few years. FIRES would cease to rage over the country, drying it up, lessening the probability of rain, and hastening erosion, for everyone would combine to lessen their incidence and their severity. ROADS would be constructed so that they remained roads, and did not become first drains, then gullies, and precautions would be taken to see that cattle paths and tracks did not suffer the same fate. Wherever cultivation was carried out, there would be contour ploughing and terraces, or strip-crops, and wind-breaks. THERE WOULD BE TREES EVERYWHERE: on hill-sides too steep for cultivation, trees would be planted to prevent erosion and to conserve water; on stock farms they would be planted in windbreaks for shelter, and in clumps for shade; and in towns they would be planted to make them cool, shady, and attractive.

"It is a question," many people will say, "of money." That is true, at any rate, of reconditioning schemes. But what of it?, and what better security could there be for an investment than increased fertility,—which means productivity—of land? Warning and encouragement both come from America, and are not without significance to us in Kenya.

In Coon Valley, where ploughing is done by guess and by gosh, where a terrace is almost a curiosity, where the cattle have eaten the grass of the high spots until they are as bald as tombstones, FARMING IS ALL DONE AT AN ACTUAL LOSS. . . . a large part of Coon Valley is already RUINED."

BUT

In Pennsylvania, where the sturdy farmers of York and Lancaster Counties plow on contour lines, terrace their land where necessary, and keep the grass cover growing on their hill-tops by keeping their stock from grazing it off, their ungullied farms are just

as productive as they were 250 years ago. THESE MEN HAVE FARMED AT A REAL PROFIT BECAUSE THEY STILL HAVE THEIR TOPSOIL."

It is as true in Kenya as it is in Pennsylvania that it pays to check erosion.

The aims of the Kenya Arbor Society are:—

- (1) To safeguard the forests of Kenya.
- (2) To encourage tree-planting.
- (3) To promote the conservation of soil and water.

The Society welcomes as Members all who wish to further these aims. The annual subscription is Shs. 5/-, payable to the Hon. General Secretary, Box 3, Nairobi.

Published by the Kenya Arbor Society, May, 1937.

Pamphlet No. 1/37.

C. O.

38184/37.

2

Mr. Flood. 15-6

Mr. J. Stokdale 15/6

Mr.

Sir C. Parkinson.

Sir G. Tomlinson.

* Sir C. Bottomley. 16.6.

Sir J. Shuckburgh.

* Permt. U.S. of S. 17/6

Parly. U.S. of S.

* Secretary of State.

(com.)

157 (8-6-37)

JUN 22 Sir,

DOWNING STREET.

23 June, 1937.

DRAFT.

KENYA

CONFIDENTIAL (2)

NO.

GOVERNOR

I have etc. to acknowledge the receipt of Sir Armigel Wade's despatch No. 56 Confidential of the 17th of March, in which he enclosed a summary of the replies received to the Secretariat Circular issued in March, 1936, on the subject of soil erosion. Since then Kenya has been visited by my Agricultural Adviser, and I understand from him that although the problem is being faced and being tackled with energy ^{and} ~~and~~ with resources ^{as} which can be made available, yet the fact must be faced that in the future there will be a need for the expenditure of much greater sums than in the past, and
for the

FURTHER ACTION.

the devotion of much greater effort to the problem if soil erosion is to be combatted in a satisfactory manner. During the period of depression it has, of course, been impossible for Government to devote the necessary funds to this service, but I trust that it may now be possible to begin an organised and systematic campaign against this threat to the whole prosperity of Kenya.

2. As you no doubt realise fully, the question of soil erosion, together with its attendant evils, is a matter which affects not the Agricultural Department only, but all departments of Government;—Administration, Forestry, Veterinary, Medical, Agricultural, and Public Works alike. In addition it is necessary that the work to be done in the field should be directed with common sense and understanding of the practical needs of the situation. For that purpose it is well to take advantage of whatever experience is to be found in other parts of the world. You have, in another despatch,

suggested

C. O.

Mr.

Mr.

Mr.

Sir C. Parkinson.

Sir C. Tomlinson.

Sir C. Bottomley.

Sir J. Stuckburgh.

Permt. U.S. of S.

Parly. U.S. of S.

Secretary of State.

DRAFT.

FURTHER ACTION.

suggested the appointment of Mr. Maher as Soil Erosion Officer, and I have accepted that recommendation and suggested to you that he should be sent to study the work which is being done in the United States of North America. Similarly, Mr. Landridge, whose work in the Kamasia Reserve has been commended, might well derive much benefit from a visit to Basutoland, where he could inspect the work which has been performed there. By such means it may be possible to avoid making mistakes which may be an expensive matter in questions of this kind, and the gaining of experience is, in any case, desirable.

3. Sir Frank Stockdale informs me that, in his opinion, the expenditure to be contemplated ~~is~~ ^{may} be in the neighbourhood of £25,000

a year for the next five years on anti-erosion
measures and an equal sum for an equal period
in developing better systems of agriculture *designed to check erosion.*

It is now recognised that faulty agricultural
methods are responsible for erosion at least as
much as over-stocking, and the indiscriminate
encouragement of agricultural crops, without
regard to whether the land is suitable, has
~~also~~ contributed to the gravity of the
present situation *in certain parts of Kenya, as in other parts of
the world.*

4. In bringing this opinion of my
Agricultural Adviser to your notice I feel
bound to point out that ~~the~~ the problem is one
which must be dealt with by regarding Kenya
as a whole. It would be idle to hope that
measures could be devised which would deal with
the problem of soil erosion in one small area
or that the question admits of division between
the Highlands and the native reserves. It is
therefore impossible to contend that expenditure
on this work can be classified as expenditure
devoted either to European or to native interests,
and

*Similar separate
projects will be required
to be worked out for
well-defined settlement
areas*

*without taking
cognizance of the
natural configuration
of the country.*

- C. O.
- Mr.
- Mr.
- Mr.
- Sir C. Parkinson.
- Sir G. Tomlinson.
- Sir C. Bottomley.
- Sir J. Shuckburgh.
- Perm. U.S. of S.
- Parly. U.S. of S.
- Secretary of State.

and it must be regarded as a defence
measure for the Colony as a whole against
a dangerous enemy.

I have, etc.

(Signed) W. ORMSBY GORE.

DRAFT.

FURTHER ACTION.

KENYA.

No. 56

CONFIDENTIAL.



GOVERNMENT HOUSE

NAIROBI.

KENYA

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17 APR 1937
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17 March, 1937.

Sir,

(2) on 38144/36

I have the honour to refer to your predecessor's Confidential despatch of the 17th January, 1936, approving the issue of orders by headmen under Section 8 (r) of the Native Authority Ordinance for the purposes of

- (a) requiring the able-bodied men to take such measures for dealing with soil erosion as may be necessary;
- (b) requiring the able-bodied men to extinguish bush and forest fires, and to cut fire-breaks in, or adjacent to, forest reserves in Native Reserves.

The Chief Native Commissioner's approval of the issue of orders for these purposes was promulgated in Government Notice No. 118 of the 10th January, 1936.

C. G. Gore

In paragraph 2 of Mr. Thomas's despatch information was requested as to the nature of the orders which it was proposed should be issued for these purposes. Orders under this authority have been issued in the South Nyeri, Keru, Machakos and Kitui Districts of the Central Province, in the Teita District of the Coast Province, and in the Mandi, Algeyo-Marakwet and Samburu Districts of the Rift Valley Province, after consultation with and with the approval of the Local Native Council in each case. These orders provide for the contour-planting of napier grass and the digging of trenches ...

THE RIGHT HONOURABLE
W. CRMSBY GORE, P.C., M.P.,
SECRETARY OF STATE FOR THE COLONIES,
DOWNING STREET,
LONDON, S. W. 1.

trenches on steep slopes where the land has been or is being cultivated and is consequently eroded or liable to erosion; for the prohibition of cultivation in the immediate neighbourhood of springs, gullies, roads or streams; for the planting of grass on bare fallows; for the demarcation by hedges of stock routes with a view to preventing gully formation; and generally for the adoption of anti-wash measures such as terracing and contour-planting of crops and trees which can be carried out during cultivation.

3. In all districts, including non-native areas and these native areas in which orders have not actually been issued under the native authority ordinance, the dangers of erosion are being continuously brought home to the people both by propaganda and by a growing realisation that the work now being done may be insufficient to check the destructive forces which have converted many parts of this country into almost a desert. In March, 1936 the Standing Board of Economic Development issued a Questionnaire on the subject to officers of the Administration and to Departments concerned. The replies received were collated in a memorandum, a copy of which is enclosed. The Board considered this memorandum at a meeting held on the 12th February, and I enclose a copy of the relevant extract from the Board's minutes. As recommended by the Board, an officer of the Agricultural Department is now engaged in a survey of the Colony with a view to correlating the demands and need for reconditioning and protective works in the various districts in order of priority. I feel that the difficulty of dealing effectively with the problem of soil ...

SOIL EROSION

The following is a resume of the replies received to secretariat Circular letter of the 30th March, 1956, on the subject of soil erosion. In considering this question it is desirable to recognize at the outset that the problem is the practical one of

- (a) restoring or reconditioning land already deteriorated;
- and
- (b) preserving and protecting good land against erosion,

and that consideration can and should be given ^{to} it ad hoc, quite apart from the long-range and more theoretical problems of future land utilization policy. The causes of erosion are known and the measures necessary for (a) restoration and (b) protection are also fairly clear. The question which the Board is called upon to consider appears to be to what extent can such measures be carried out more effectively and more widely than they are being carried out at present.

2. The replies to the questionnaire show that bad erosion both gully and sheet, is occurring or has occurred in large areas (approx. 1700 sq. miles) of North, Central and South Kavirondo: in West Suk, Elgeyo-Kamasia and Samburu; in parts of the Trans-Nzoia, Uasin Gishu, Nakuru, Nanyuki and Wimeru districts; in the lower areas of Fort Hall and Embu, and in Kitui and Machakos. It is occurring or has occurred moderately in the South Lumbwa Native Reserve, Central Kavirondo, (Kisumu-Kajuhu-Teriki- 120 sq. miles), Kisumu-Londiani (Kibigori-Chemelil-Muhoroni), Teita, S. Nyeri, Meru, Embu, and Kajiado districts. In the Coastal belt there is some erosion in the neighbourhood of Changamwe.

3. The causes of erosion are the same in nearly all cases, namely:-

- (a) Denudation of steep hillsides;
- (b) Shifting cultivation of hillsides without terracing or anti-wash measures;
- (c) Grass fires;
- (d) Lack of water supplies, tending to concentrate grazing and cultivation;
- (e) Cattle tracks made by stock travelling to water;
- (f) Goats;
- (g) Drought conditions followed by heavy rains;
- (h) Late planting of crops;
- (i) Rainfall on light soils deprived of humus by a one-crop system of farming;
- (j) Road construction.

In general the causes may be summarized as the removal of the soil cover/

cover by methods which expose the soil itself to the maximum destructive effort of rain, sun and wind. Such removal is connected with cultivation at least as closely as with over-stocking, although overstocking may have contributed in the past to present conditions. It will be observed that, generally speaking, in the purely pastoral areas, such as Masai, there is little or no erosion. In west Suk erosion is attributed to cultivation of finger millet and the cutting out and burning of forest for the purpose of such cultivation. In Kamasia in dry weather flocks and herds travel as much as 10 miles for water; these tracks become water-courses and then gullies. The gullies widen and deepen, like the gully which "started under the eaves of a barn in Georgia less than 75 years ago to-day it stretches across two counties, measures from 125 to 200 feet deep and from 100 yards to 1 1/2 miles wide ten thousand acres, including farms, roads, woods, barns, homes and churches, were swallowed up by this gully." The information available goes to show that the part played by cattle in assisting erosion is at present not so much one of over-grazing or over-stocking as of gully-ing, and that the provision of adequately distributed water supplies in the native areas (toward which a grant of £42,000 has been obtained from the Colonial Development Fund) is no less important, in its effect on the condition of the land, than the provision of an outlet for cattle in the form of a meat extract factory such as Liebig's, which if prices are favourable, is not likely in itself to encourage reduction in numbers.

4. Erosion is reported to be increasing definitely or rapidly in all the districts named in para. 2 above. Soil deterioration is progressing, the land tends to be used more and more with increased loss of fertility and the process becomes a vicious circle. Thus, in the Soy-Kiminini area of the plateau, "many farmers are forced for financial reasons to go on taking maize off old washed shambas in spite of the fact that yields have dropped from 12 bags to the acre to 0." On the Tambach escarpment "tree roots are sometimes seen three feet above the ground." In Mbere "the rate of increase is most noticeable in those areas where erosion is already most advanced."

The above paragraphs deal with items (a) to (c) of the questionnaire. Items (d) and (f) can conveniently be dealt with together under the heading "what has been and is being done?"

6. In the native areas in which erosion has been apparent for some years, e.g. Machakos and Kamasia, a considerable amount of both reconditioning and protective work has been and is being done. The Machakos Reconditioning Committee has made an exhaustive survey of its own problem and a Reconditioning Officer, shortly to be augmented by a second Reconditioning Officer, has been carrying out the programme approved by Government and the Local Native Council. This consists partly in the demarcation of steep lands as permanent forest areas and their afforestation at the rate of some 350 acres per annum, reafforestation of other areas by natural regeneration and a programme of planting being carried out by the Forest Dept., and partly of contour planting of Napier grass, stagger trenching of eroded lands and construction of dams, with strict control of the use of the re-conditioned areas either for stock or for cultivation. The programme is being carried out effectively with native co-operation and chiefly from Local Native Council funds, supplemented in 1937 by some £400 provided by Government for a second Reconditioning Officer. It is proposed to prohibit entirely the grazing of goats on the Yatta portion of the Machakos Native Reserve, and to demarcate and drain stock routes to prevent gullies. Grazing, cultivation, burning and cutting of trees or bush around spring heads and water courses is being discouraged.

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In Kamasia the Reconditioning Officer has concentrated on forming barrages, contour draining, terracing and planting of grass and windbreaks. He estimates that over 14,000 acres have been dealt with successfully, and the work is proceeding at the rate of some 2000 acres per annum. Only limited numbers of cattle and no goats have been allowed to return to the reconditioned areas.

In Embu, Teita, Kajiado and Meru contour planting of napier grass is being done. wattle planting is being strongly developed in Embu. In Teita broad-base terracing is being carried out and catchment areas afforested. Stone terracing is being practised in Meru. It seems that little is being done in Kitui, beyond the

laying/

laying of stalks on contours.

In all native areas there is continuous propaganda on the subject. It should be remembered in this connection that it is only within the last few years that the importance of erosion has come to be recognized. Earlier propaganda urging the development of native production contained little warning as to the results of agricultural malpractices, and the effect of mere propaganda on the native mind is slow. Moreover, the propaganda to which most attention is paid is remedial, not ^{(?) protective} productive. In Nyanza "very little general result is to be seen from demonstrations and propaganda except in those places where an officer has had the time personally to supervise a considerable amount of work". Some interesting reclamation work in the South Maragoli - Tinki area of North Kavirondo was carried out in March - May, 1930. The cost of this work, which covered an area of 500 acres, was approximately 125. The work included ^{in expense} trenching, planting of Napier grass and trees, stone terracing and general repair work and was carried out by a gang of 100 labourers in a little over two months.

In all native areas grass fires are either prohibited or discouraged. In North Kavirondo "a Local Native Council Resolution aims at preventing the deforestation of stream banks, but alluvial gold mining has militated against this". Tree planting is encouraged by Local Native Council Resolutions and by free issues of seedlings. In South Kavirondo 180,000 trees are issued annually from nurseries.

In non-native areas the problem is almost confined to arable land, and it appears from the information available that in some areas (e.g. the Plateau) too little is being done in the way of terracing and afforestation. Afforestation on farms consists at present almost entirely of wattle or gum plantations for fuel purposes. Demonstration windbreaks are being planted by the Department of Agriculture, and individual farmers appear to be doing something in this direction, e.g. in the Rongai valley. On the Plateau an area of some 2000 acres is now broad-base terraced, and it is said to be "shown very conclusively that terracing is the only way to save eroded maize land".

7. Item (g) of the questionnaire requests information as regards over-stocking. The general effect of the replies received is that there is practically no over-stocking in the terms of acres per beast, but that water supplies are so poorly distributed as to concentrate grazing in certain limited areas. A more widely distributed system of watering places for stock would enable control to be exercised and rotational grazing, permitting the grass to seed, to be introduced. This is contemplated in Masai, Machakos and Kitui and on the Yatta and is one of the purposes for which the £42,000 grant from the Colonial Development Fund has been made. There seems to be no doubt that in areas that were grossly over-stocked in 1930 drought and locusts have combined to redress the balance.

8. Items (e) and (h) of the questionnaire remain to be dealt with, namely, in other words, "what can and should be done to deal with this problem in addition to what is being done at present?" To deal first with the preservation or protection aspect of the problem, one of the protective measures suggested was "the affording of greater protection to streams and catchment areas." This measure is almost unanimously supported. In August 1936 the Water Board considered draft rules which had been prepared in consultation with the Forest Department with this purpose in view. The draft rules included the two following provisions:-

"3. If it should appear to the Water Board that any landowner is or has been allowing any trees or bushes to be felled, cut, burned, injured, or removed, or is or has been allowing any cultivation on any land on which such acts or any of them who would in the opinion of the Water Board affect detrimentally the water supply of any spring, swamp or body of water, the Water Board may by written order prohibit any further such acts and may order the land holder to take steps to restore to the land such soil covering as the Water Board shall direct.

4. If the landholder shall fail to comply with the orders of the Water Board given under Rule 3 of these rules the Board may call for re-conditioning of the land to be carried out by the Board's officers or such other agency as it may deem fit and all costs and charges in connection with this said reconditioning shall be paid by the land-holder, and if not so paid shall in addition to any other penalties provided under the Water Ordinance, 1929 be recoverable as a debt due to the Crown".

The Water Board, however, rejected these rules as too wide and as dealing with a matter which did not come within the Board's jurisdiction.

It appears that there would be widespread public support for legislation on the lines of section 32(1) of the Nyasaland

Crown Lands Ordinance, 1931, which provides that no person shall, on land leased, without the written authority of the Conservator of Forests or District Commissioner, cut or remove any trees or timber within thirty yards of any river or stream. The introduction of legislation restricting the cutting of private forests in other countries is strikingly illustrated in the note prepared by the Forest Department (circulated). Special cases, where fly control measures necessitate clearing of stream banks temporarily, should not be allowed to interfere with the application of the principle.

The indications are that there is a strong case for a special "Land Conservation" Ordinance prohibiting the cutting of trees or timber and the clearing of bush

- (a) within X yards of any river or stream;
- (b) on a slope steeper than X percent;
- (c) in certain scheduled areas

without the approval of the District Commissioner or Forest Officer, and prohibiting entirely the burning of trees, timber or bush throughout the Colony. Such legislation, with the co-operation of honorary "wardens", would cost nothing, and would strongly reinforce public opinion in the direction in which it is already tending.

9. Other protective measures recommended include the reforestation of hillsides and the tree-planting of bare land. Many of the replies recognize the necessity of this, but complain of lack of funds. It is not clear, why, at least in native areas, such work should require (except in the case of large-scale plantations) the expenditure of public funds. Seedlings can be raised, planted and maintained by the right holders concerned for no expenditure at all other than that of their own labour. Some Local Native Councils have passed a Standard Resolution requiring every man to plant not less than 10 trees per annum. Measures aiming at compulsion in this way are often ineffective, e.g. the maintenance of the trees when planted is as important as their planting. Voluntary effort is being encouraged and the acreage being planted with wattle in the Central and Nyanza Provinces is remarkable. The fruits of this may not be apparent for some years but the districts (e.g. South Nyeri, Fort Hall and South Lumbwa) where

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this has been an active policy in the past afford ample evidence of its success. The wattle tree is valuable to the native in so many ways that its planting should not be discouraged merely because of uncertainty in the bark extract market.

10. The third important protective measure is the immediately practicable one of improving and providing water supplies according to a plan which will enable use to be made of land at present useless for lack of water for men and stock and will assist in the resting of those areas in which the water factor has tended to concentrate both cultivation and grazing. The plans for this campaign in native areas are explained in the memorandum supporting the application for the £42,000 Colonial Development Fund grant. The provision of dams from Local Native Council funds in Masai, Machakos and Kitui is already being carried out to some extent. There is a feeling that boring should not be employed except in places where water cannot be obtained by any other means, since bore holes are expensive both to make and to maintain, and larger areas can be covered with the funds available if simple and generally practicable shallow wells and rock-catchment and earth dams can be provided instead.

11. To come now to the restorative or reconditioning aspect, it is impossible to place in order of urgency the various schemes for trenching, contour planting, reforestation and terracing. It is, however, clear that valuable experience has been gained as to what are the best practical methods in the various eroded areas, and that great importance must be attached to the prevention of the spread of gully erosion in places where gully-formation has begun. It appears that some expenditure of public funds, to supplement the work being carried out by Local Native Councils, must be contemplated, and that the provision of staff experienced and specialising in this kind of work is the chief requirement. The best method of working out a co-ordinated programme would appear to be that an Officer of the Department of Agriculture should be deputed at once to make a comprehensive tour of the eroded areas, to discuss with District Commissioners and the officers engaged on the work the actual immediate needs of the situation and to put up proposals for works required in order of priority.

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This officer would be kept in touch with the plans for water supply development and would also be useful in transferring experience from one district to another.

12. - It will have been observed that no reference has so far been made to the scheme suggested by the Land Bank for carrying out anti-erosion work on farms. The scheme provides that, where erosion is taking place, the farmer would be requested by the Department of Agriculture to carry out certain anti-erosion measures applicable to the particular case. If the farmer fails to do so, the Director of Agriculture may, after reconsideration and due notice, enter upon the property and do the necessary work (presumably recovering the cost from the farmer, though the scheme does not say so.) A modified scheme submitted by the Land Bank avoids the principle of compulsion, but for that very reason would appear likely to be ineffective.

It is probably true that in most cases where erosion is occurring on farms, the difficulty is finance. Anti-erosion measures fall within the farming operations for which finance can be obtained from the Land Bank, if the farmer's credit is good. It is for consideration how far farmers who either will not or cannot carry out measures to prevent serious erosion should be assisted to do so, or have the work done for them by direct Government intervention.

13. It will also have been observed that this resume does not attempt to deal with the question of maintenance of soil fertility, but is confined to the subject of the Questionnaire, namely, soil erosion.

The Board had before it a memorandum summarising the replies received to Secretariat Circular letter of the 30th March, 1936, and extracts from reports made by local representatives of the Land Bank, and in addition a resolution of the Board of Agriculture urging the "immediate necessity of appointing an ad hoc Committee to formulate a policy and advise Government on the steps that should be taken to deal with" the question of soil conservation.

Considering first the Board of Agriculture's resolution, the Board observed that the personnel of the Committee suggested by the Director of Agriculture comprised the Director of Agriculture, the Chief Native Commissioner, the Director of Public Works, the Director of Medical Services, The Conservator of Forests, Mr. Daubney, Mr. Wolryche-Whitmore, Mr. R.O. Barnes and Mr. Maher as Secretary.

Members of the Board expressed the views that the appointment of another Committee would be unlikely to accelerate consideration of this problem, and that one reason for the Board of Agriculture's proposal appeared to be that the Board of Agriculture felt that the Standing Board of Economic Development was making no progress with it; that the question requiring attention first was the urgent and

practical one of soil erosion, decisions on which might well be followed but not preceded or accompanied by determination of the wider and more complex issues of land utilisation policy; and that if technical e.g. engineering advice was required regarding the major works to be carried out it would be better to obtain such advice from the experts (e.g. the Director of Public Works or Mr. Barnes) individually rather than as members of a new and separate Committee.

The Board endorsed the proposal put forward in the memorandum that an officer of the Department of Agriculture should be deputed to make a survey of the whole Colony with a view to correlating the demands and need for re-conditioning and protective works in the various Districts in order of priority, his proposals to be considered by the Board in due course. The Board noted that Mr. A.C. Maher was already making a start with this programme in the Machakos District and considered that, if possible, Mr. Maher should be the officer to be charged with this duty. It was agreed that on the conclusion of his survey of Machakos Mr. Maher should be consulted as to whether an engineer such as Mr. Barnes should be appointed to accompany him on the survey. The Board felt that, while Mr. Maher might require engineering advice on particular big projects, there should be no necessity for an engineer to accompany him throughout his tour, but left the point open for discussion by the Chairman with the Director of Agriculture and Mr. Maher. It was recognised that technical advice would be necessary, but the Board inclined to the view that ad hoc consultation would be the best course and that Mr. Maher's final proposals should be submitted to technical examination generally (e.g. by the Director of Public Works) before they came before the Board.

In view of these considerations, the Board resolved that in its view the appointment of the Committee proposed

by the Board of Agriculture would not expedite matters and was unnecessary at the present time.

Mention was made of the possibility of assisting some firm to secure equipment for a travelling "circus" to carry out terracing, etc. on farms for a charge. It was noted from the Trans-Nzoia extract from the Land Bank Report that a unit of this kind was operating in the Trans-Nzoia.

Colonel Griffiths referred to the value of windbrakes and suggested for consideration that afforestation on farms would be encouraged by a reduction of rent pro rata to the area afforested. Trees not only protected land from wind erosion but produced trash contributing to conservation of the soil.

The Board noted, as regards goats, that powers directed towards the "demonstration" of goats were contained in the new Native Authority Bill, and that the new Resident Native Labourers' Bill contained provision for local action regarding squatter stock, but considered that any possible steps should be taken to popularise the Savings Bank and increase the facilities offered by the Bank to natives in the Reserves.

The Board then considered the proposal made on page 6 of the memorandum for 'Land Conservation' legislation on the lines there described, and recommended that such legislation should be prepared and introduced. The Board recognised that difficulties might be encountered in the drafting of the Bill, but was in favour of such legislation in principle and did not desire to be asked to consider the details of it.

Two posters offered to Government by the Arber Society were shown to the Board. The Board suggested that the Arber Society might be informed that Government was considering the production of a poster or posters on its own account and, while appreciating the offer, did not therefore wish to take advantage of it.

Why not
offer
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proposed?

THE NATIVE AUTHORITY ORDINANCE.

(Chapter 129 of the Revised Edition)

NOTICE.

WHEREAS it is provided inter alia by section 8 of the Native Authority Ordinance (Chapter 129 of the Revised Edition) that any headman may issue orders to be obeyed by the natives residing within the local limits of his jurisdiction for any purpose approved by the Governor in writing.

And whereas the Governor by notice dated the 9th day of October, 1926, appearing at page 1187 of the Revised Subsidiary Legislation did delegate to the person for the time being holding the office of Chief Native Commissioner the powers conferred upon the Governor by the said Ordinance:

Now, therefore, in exercise of the powers thereunto enabling me, I do hereby approve of the purposes set out in the Schedule hereto to be purposes in respect of which any headman may issue orders in accordance with the provisions of section 8 of the said Ordinance.

Nairobi,
This 10th day of February, 1936.

H. R. MONTGOMERY,
Chief Native Commissioner.

SCHEDULE.

1. Requiring the able-bodied men to take such measures for dealing with soil erosion as may be necessary.
2. Requiring the able-bodied men to extinguish bush and forest fires, and to cut firebreaks in or adjacent to, forest reserves in Native Reserves.