KENYA

44044

C.O. 44044 172

REC'D 4 SEP 20

...ER, D.O.

...20

...EPTR

...ious Paper.

MANUFACTURE OF COMMERCIAL ALCOHOL

Asks if permissible in B.E.A.

Mr Parkinson.

After a long search I can find nothing really satisfactory on the point. The replies to the Questionnaire no. 4 of 1917 do not help us (see however no. 9). You will see however, that the point of manufacture was raised on 1915 on 17560/15 when the Govt was asked to amend Order no. 12 of 1909 (not no. 9 as stated in the desp. in error).

I find that that Order has not been amended, the reply appears to have been received to the despatch. If I send as copy of this letter to Govt. [illegible] his [illegible]

At the same time call attention to [illegible] desp. on 17560/15 & ask how the matter stands.

Inf. the writer of this, of action taken. We might [illegible] [illegible] to the dept of Scientific & Industrial Research [illegible] [illegible] 8.9.20

(Incidentally, I have learnt that Uganda has given permits to manufacture alcohol for commercial purposes), & assume that permits are necessary but hardly under the above Order.)

[illegible]

...quent Paper.

...551

...) Wt. 14145/24 Gp.163 25,000 8.20 W & S (W & A L)

For British Commonwealth Union

24 Abingdon Street,
Westminster,
S.W.1.

March 28th, 1920.

Dear Colonel Amery,

173

I forward you herewith copy of the Memorandum for which you asked. I shall be very grateful if, after due consideration, you will let me have your views on the points raised therein.

Yours sincerely,

George Bowyer

Lt. Col. Amery, M.P.
Colonial Office.
Downing Street,
S.W.1.

C O
16502
REC
30 MAR 20

Telephone:Kensington 4232.
Reference:B/S/F 406.

9 Rossetti Mansions.
Cheyne Walk.
Chelsea. S.W.3.

September.2nd 1920.

The Colonial Office.
Westminster. S.W.1.

C O
44044
REC'D
4 SEP 20

Dear Sirs,

I wish to ascertain if it is permissable to manufacture "commercial alcohol" (motor spirit) in British East Africa, and would be much indebted if you would advise me as to which department I should apply for such information;

Awaiting the favour of your reply,

Believe me,

Yours Truly,

D.O. Brenner

44044/20

Kenya

Letter to Sir [illegible]

11 Sept. 1920

DRAFT.

D. O. Bremner Esq.

Sir,

I am sc. to acte the rect of your letter of the 2nd of Sept. enquiring whether it is permissible to manufacture (Kenya (late E. A. P.)), commercial alcohol in ~~[illegible]~~ & inf. you that enquiry is in being made of the Govt of Kenya by telegraph as to the present position & further communication will be sent to you on the receipt of the reply.

(2) It is [illegible] that a certain alcohol of your letter has not been sent

(Sgd) G. G. 2

MINUTE.

Mr. Copinger 10.9.20

Mr. Parkinson 10/8

Mr.

Mr. Griddle

Sir H. Lambert

Sir H. Read

Sir G. Fiddes

Col. Amery

Lord Milner

Sent 2.48 [illegible] 20

[illegible] Telegram

[illegible] unbelief

13 September Ref my desp [illegible] of

Whatnegro

4 May 1915 no. 305 what

[illegible] residuate

[illegible] present position with regard to

[illegible] 10.9.20

[illegible]

manufacture of commercial

[illegible] Parkinson

[illegible] Is permit necessary [illegible]

[illegible] what conditions would it be granted

[illegible]

Annex 4638

EAST AFRICA AS A SOURCE OF POWER ALCOHOL.

The possibilities of producing power alcohol in Kenya Colony and in the following protectorates, namely, Nyasaland, Somaliland, Uganda and Zanzibar, are dealt with in this memorandum.

In response to a questionnaire, prepared by the Department of Scientific and Industrial Research, and issued by the Colonial Office on the 26th April, 1920, to the Governors, replies were received from Kenya Colony, Nyasaland and Uganda: the Governor of Nyasaland also forwarded a report dated the 19th August, 1919, by a committee appointed by him to inquire into, and report on the possibilities of the local production of alcohol for power purposes. In the case of Somaliland and Zanzibar, it is stated that the materials mentioned in the questionnaire either are not grown at all, or are not grown in sufficient quantities for the production of alcohol on a commercial scale. In the case of the other three protectorates, the raw materials produced are as follows:-

Kenya.	Nyasaland.	Uganda.
(a) Sugar cane.	(a) Sugar cane or Sorghum can be grown in certain districts, Bananas. Plantains.	(a) Sugar cane. Bananas. Plantains.
(b) Maize, Potatoes, Cassava.	(b) Maize, Sweet Potatoes, Cassava, Sorghum grain.	(b) Maize, Sweet Potatoes, Cassava, Millets, Rice, Wheat.
	(c) Bamboos, Coarse bush grass.	(c) Elephant Grass, Papyrus.

From the replies to the questionnaire, it [illegible] that very extensive areas are available [illegible] production of these crops in Kenya Colony, [illegible] are probably [illegible]

also in Uganda, in addition to the ground already cultivated with them for food purposes.

According to the latest information, the acreage under cultivation, and the yields per acre of the materials enumerated under (a) and (b) above are as follows:-

	KENYA.*		NYASALAND.**		UGANDA.***	
	Acreage	Yield per acre tons	Acreage	Yield per acre tons	Acreage.	Yield per acre tons
L.						
ane		25-40	-	-	1,943	18
		-	-	-	-	5
ns		-	-	-	579,965	-
		1	9,901	0.66	21,183	2
s.		3	-	5.00	246,535	4.5
		No records	-	6.00	10,346	8
		-	-	0.65	-	-
		-	-	-	356,134	0.4
		-	-	-	1,830	-
		-	-	-	15017	

No figures available

The area under European cultivation in Nyasaland for the year ended the 31st March, 1920, was 47,781 acres, cotton, tobacco, tea and rubber accounting for two-thirds. The Uganda figures are those for native agriculture; the European agriculture is almost entirely confined to coffee, rubber and cocoa; the area under cultivation being 31,179 acres. The figure given for sweet potatoes does not include large areas in the eastern provinces which have not been estimated.

* Replies to Questionnaire dated the 29th July 1920.
** Annual Report for the Dept. of Agriculture for the year ended 31st March 1920.
*** " " " " " " " " " " " " "

The following information is from the replies to the questionnaire, and from other sources:-

Kenya.

Sugar-cane growing is in its infancy, but attempts are being made to establish the industry, for which purpose Mauritius and Australian capital are being interested. About 1,000 acres, have been planted already. The estimated sugar consumption of the Colony is 3,000 tons a year; x the 95% alcohol equivalent it about 130,000 gallons. It is also stated that a large natalite factory is under construction at Kuiru, x x presumably to use waste molasses or maize. On several maize growing areas, there should be no difficulty in securing an assured supply of considerable quantities of this grain, provided the price offered is attractive to the grower. Potatoes and tapioca can be produced in quantity, and the cultivation of the former would almost certainly be taken up by European farmers if there was an assured market, at present the crop is chiefly grown by natives for local consumption. Unfortunately crops, especially grain ones, suffer at times from adverse climatic conditions.

Uganda.

The areas cultivated at present are restricted to local food requirements, they are capable of expansion by 200,000 acres if a market is provided for the produce. At present the demand for foodstuffs is fully equal to the supply, and therefore foodstuffs for the production of alcohol would need to be specially grown, as the supply by purchase from native sources would be unreliable.

x The Times Trade Supplement 15th January, 1921.
xx The Times Trade Supplement 20th September, 1920.

Kenya.

The quantities of the materials available for distilling purposes are small in the case of sugar cane, maize and cassava; thousands of tons of sweet potatoes and plantains could be made available, and some hundreds of tons of millets. It is considered highly probable that 96% alcohol could be commercially produced in the Protectorate from the materials enumerated above. Most of these are extensively cultivated for food purposes, and the areas could be rapidly extended. The local demand for this product, adapted for use in internal combustion engines, would be fairly large and permanent.

The possibilities of all these materials for the production of power alcohol on a commercial basis, depend in great measure on the price at which they could be grown for the purpose, and, if they have to be transported to the factory, then the cost of transport and of labour also become important factors.

Certain prices per ton are given in the replies to the questionnaire as ruling at the then date, namely July 1920. They are as follows:-

		NYASALAND	UGANDA
	£8.	£5.	£5. 15. 0.
Potatoes.	£1.	£1.	£3. 7. 6.
		£1.	£3. 12. 6.
Grain.		£6.	
		-	£4. 12. 6.

These prices are not absolutely prohibitive, and if the various materials could be grown in excess of food requirements they would not command probably even these figures. Native labour in all the protectorates is cheap, and if it is available, increased production should not offer very great

difficulties. Of the various materials, cassava would be probably the most profitable, because it has a high yield per acre, a high starch content and is apparently the cheapest of all to grow. The yield of alcohol per acre is therefore considerably higher, and the cost considerably less than for the other materials; the sweet potato coming next in this respect.

Sisal waste is a possible source of power alcohol in Kenya Colony. It has proved itself as an East African product. It will grow almost anywhere and it is hoped that it will be able to compete successfully with the manilla obtained outside the Empire. X

Sisal fibre is obtained from the leaves of the plant. These weigh from 1¼ to 1¾ lb., and the fibre amounts to only about 3 - 4% of the weight of the leaf. 1,000 leaves average from 54 - 60 lb. of fibre, and the yield per acre is estimated at about half a ton. XX

Sisal waste left after removal of the fibre has been used for the production of alcohol in Yucatan. The leaves contain about 1½% of sugar. XXX Based on these figures, the yields of 95% alcohol per ton, and per acre of leaves, are 15.54 and 210 gallons, respectively. The export of sisal fibre from the East African Protectorate 1917-18 was 80,[illegible] cwt. X The pulp resulting from this fibre would, on the above basis, produce about 350,000 gallons of 95% alcohol.

According to the [illegible] 1917, in what was German East Africa, there are hundreds of thousands of acres under sisal, with probably 30-40 decorticating establishments served by many [illegible] of light field railways which have been [illegible] at the rate of

X East Africa Protectorate Report for 1917-18, [illegible] 1919.
XX Encyclopaedia Britannica [illegible] Edition.
XXX "Alcohol [illegible] Production, [illegible] as a [illegible] Application" by [illegible] S. Simmonds, 1919

[illegible],000 to 20,000 bales a month.

Much useful information on the question of producing alcohol in Nyasaland is contained in an Interim Report, dated [illegible] 15th August, 1919 by a Committee appointed by the Governor in May, 1918.

On the assumption that the motor fuel requirements of the Protectorate are in the neighbourhood of 100,000 gallons a year, it is estimated that 1,560 acres of sugar cane would have [illegible] grown, producing 4,680 tons of sugar, to obtain the molasses which would give the above output.

The following estimated figures relative to the production of alcohol from the raw materials mentioned are also given. The yield per ton is based on the use of the Amylo process of manufacture:-

	95% Alcohol Gallons per ton	Average crop tons per acre.	95% Alcohol Gallons per acre.
[illegible]ze.	85	0.60	51.0
[illegible]rghum grain.	87	0.65	56.5
Sweet Potato	35	5.00	175.0
[illegible]ssava	39	[illegible].00	234.0

It is suggested [illegible] reasons given in the report, that these [illegible] materials should [illegible] grown in rotation on equal areas of land.

The questions of the cost of transport and of fuel are reviewed at some length, as well as the cost of production, and the [illegible] is arrived at that the production of alcohol from grain and [illegible] at a cost of 1/6 to 2/- per gallon, is [illegible] in the country. [illegible], however, the cost of growing the raw materials has increased about 50% since the report was written, these figures are too low; they do not allow, moreover, for the

15,000 to 20,000 bales a month.

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	95% Alcohol Gallons per ton	Average crop tons per acre.	95% Alcohol Gallons per acre.
Maize.	85	0.60	51.0
Sorghum grain.	87	0.65	56.5
Sweet Potato.	35	5.00	175.0
Cassava.	39	6.00	234.0

It is suggested for reasons given in the report, that these four materials should be grown in rotation on equal areas of land.

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conversion of a portion of the alcohol to ether, nor for the cost of denaturing, distribution packages etc. Instead of using ether to mix with the alcohol, in order to produce a liquid fuel suitable for existing internal combustion engines, it might be possible to use benzol in the event of the coal deposits, which are known to exist in the Colony, being worked, and suitable provision being made for the recovery of the benzol, should the coal be used for the production of gas or metallurgical coke. The possibility of this is referred to in the Committee's report.

Another conclusion arrived at by the Committee is as follows:- 'That the raw material would have to be grown in the immediate neighbourhood of the distillery, both to provide fuel and because transport charges would heavily increase the cost of production".

In the reply from Nyasaland to 1 (a) of the questionnaire, bamboo and coarse tuch grasses are referred to, similarly in the case of [illegible] elephant grass and papyrus are mentioned as growing [illegible] enormous areas, and in enormous quantities; the yields [illegible] are given as 6 tons and 5 tons, respectively sub dri[illegible] suitability of elephant grass for the manufacture of paper is dealt with very fully in a pamphlet issued by the Government Press Uganda in March 1919.x

Apart altogether from the fact that no cheap and simple process exists at present for the production of alcohol from [illegible] materials, the cost of collecting and transporting such bulky stuff would render its use for the purpose impossible. This would be so especially in Uganda where, according to reply to number 7. of the questionnaire, "transport facilities are primitive over large areas, and head loads would be the method employed; this is both wasteful and expensive, when wheeled

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x Correspondence relating to the Manufacture of Paper from Elephant Grass (Pennisetum purpureum) from Uganda.

traffic can be used, the cost of transport varies from 2/- to 4/- per ton mile."

Conclusions.

On a consideration of the facts and figures dealt within this memorandum, there would appear to be possibilities of the East African Protectorates becoming eventually self-supporting in the matter of alcohol, either alone, or mixed with ether or possibly with benzol, for power and traction purposes. There do not appear, however, to be any possibilities of alcohol being produced in sufficient quantities, and at a sufficiently low price, for some time to come at all events, for its export to this country to be a profitable commercial undertaking.

1st April, 1921.

EAST AFRICA PROTECTORATE.

1. (a) Sugar-cane.

(b) Maize, potatoes, cassava.

2. Very extensive areas exist suitable for the production of these crops.

3. Sugar-cane 26 to 24, maize 1, potatoes 3 tons per acre. No record as to cassava.

4. Figures cannot be quoted, much will depend on what price can be paid as the materials are competition crops. An assured considerable supply of maize should be securable if an attractive price is offered. Sugar-cane growing is in its infancy, potatoes and cassava can be produced in quantity.

5. Prices would depend on local and export values. Based on prices now (July 1920) ruling growers would expect £5 for maize and £4 a ton for potatoes. There is no market price for sugar-cane.

6. Railways exist or are being constructed for areas growing or suitable for growing these crops. Wagon transport is comparatively cheap.

7. Skilled Indian £10 - £20. European £30 - £40 a month. Unskilled native 10/- to 40/- a month.

8. Only large supplies of wood. Present (July, 1920) railway contract price is 6/50 a 100 cubic feet.

9. No.

10. A company has been formed to make Natalite and preparations are being made to begin operations.

NYASALAND PROTECTORATE.

(a) Sorghum or sugar-cane could be grown in certain districts but are not at present produced.

(b) Maize, cassava, sweet potatoes, sorghum grain, bananas, plantains.

Bamboo and coarse bush grasses.

Areas cultivated restricted to local food requirements, capacity of expansion by 200,000 acres.

Sorghum grain 0.50, maize 0.60, sweet potatoes 5, cassava 6 tons average per acre.

Impossible to estimate. At present the demand for foodstuffs is fully equal to the supply and surplus foodstuffs for power alcohol making would have to be specially grown.

Sorghum and maize £5, sweet potatoes and cassava £1 a ton.

A distillery on the lake would command a wide area of grain producing country with cheap steamer transport. Road motor transport 2/- a ton mile.

Skilled 10/- to 30/- a month according to quality. Unskilled 8/- to 10/- a month according to season.

Wood 2/6 to 3/- a cubic foot in townships, cheaper in out districts. A permanent supply would have to be planned. There are undeveloped coal deposits. Water is available in most districts.

No. It is understood that the Zambezi Sugar Companies are producing alcohol from molasses but are exporting to Natal. Information as to the quantity, quality and price is not obtainable.

Yes, if crops and fuel are specially grown. The supply by purchase from native sources would be unreliable.

UGANDA PROTECTORATE.

Mr. S. Simpson. Director of Agriculture.

1. (a) Sugar-cane.

(b) Sweet potatoes, millets, maize, cassava, rice, wheat bananas, plantains.

(c) Elephant grass and papyrus.

Sugar-cane 2,193, Sweet potatoes 248,[illegible], millets 356,134, Maize 21,183, Cassava 10,346, Rice 1230, Wheat 1,017, Plantains 579,965 acres. Bananas and plantains are the staple foods over a large area. Supply of rice and wheat does not equal the food demand.

Sugar-cane 18, plantains 5, sweet potatoes 4½, millet 2/5ths, maize 2, cassava 6 tons per acre. Sun-dried small millet straw ½, large dito 2½, maize straw 2, elephant grass 6, papyrus 5 tons per acre.

Small in the case of sugar-cane, maize and cassava. Thousands of tons of sweet potatoes could be made available. The supplies of elephant grass and papyrus are unlimited.

Sweet potatoes £2.5 to £4.10., millets £[illegible] to £11.5, maize £4.10. to £9, cassava £2.5. to £[illegible] a ton. Sugar-cane retail ½d to 1d a cane, plantains retail 3d to 2/- a bunch. Elephant grass and papyrus no local value.

Primitive for large areas, where head loads would be employed. Wheeled transport when possible 2/- to 4/- a ton mile.

Skilled £2 to £4 a month, unskilled averages 12/- a month.

[illegible] about 12/- per 100 cub. feet. Thousands of tons of cotton seed at from 5/- to 10/- a ton. Ample water at nominal price.

[illegible]

It is considered highly probable that 95% alcohol can be commercially produced from the materials enumerated above, most of which are extensively cultivated for food purposes, and the areas can be rapidly extended. The local demand for use in internal combustion engines would be fairly large and permanent.

QUESTIONNAIRE RELATIVE TO POWER ALCOHOL PRODUCTION.

hich of the following materials does the Colony/Dominion produce:-

a) Sugar or sugar-containing materials.

b) Starch or materials containing starch or similar carbohydrates.

c) Cellulose-containing materials, apart from wood and textile fibres.

hat areas are under cultivation for the above materials?

hat is the normal yield of these materials in tons per acre?

hat quantities of these materials could be made available r distilling purposes?

t what price per ton could supplies of these materials be vailable at the point of cultivation?

hat transport facilities are available and what would transport of these materials cost per ton?

hat is the cost of skilled and unskilled labour in the Colony/ominion?

hat fuel and water are available for manufacturing purposes nd at what price?

alcohol of 95% strength could be produced on an industrial cale in the Colony/Dominion and if so:-

(a) From what materials?

(b) In what quantity?

(c) At what price per gallon of 95% strength?

not, is it thought probable that 95% alcohol could be commercially produced in the Colony/Dominion, from the material entioned?