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RESTRICTED

FEBRUARY 1986

ENGLISH

15508

(12) Seychelles

PREPARATORY ASSISTANCE TO THE DEVELOPMENT PROGRAMME  
TO PRODUCE LIQUOR FROM TROPICAL FRUITS

UC/SEY/84/158

THE REPUBLIC OF THE SEYCHELLES

Technical Report: Information gathered for a full study  
on the possibilities of establishing a liquor production plant  
from tropical fruits\*

Prepared for the Government of the Seychelles  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

Based on the work of Roberto H. Moretti, Expert in Alcohol Production

United Nations Industrial Development Organization  
Vienna

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### TOURISM STATISTICS

Tourism is very important for the economy of the Seychelles. It started in 1971 with 175 visitors and went up to 78,000 until 1979; this number decreased to 47,000 in 1972 e.g. but has shown a growing tendency since. In 1984 there were already 63,400 tourists visiting the Islands. Their average length of stay is 10 days and distribution is quite even all over the 12 months of the year; in other words, around 5000 to 6000 tourists visit the Seychelles every year. The average expenditure per tourist during the average 10 nights was about 4.500 Rupies from 1982 to 1984.

Mainly European tourists visit the Seychelles but there were also many visitors from countries like the USA, Japan, South Africa, Reunion, as can be seen from the table hereunder:

	1982	1983	1984
France	7,846	8,820	11,054
UK and Eire	4,826	4,065	7,803
West Germany	5,079	9,759	8,555
Italy	6,470	5,667	7,101
Switzerland	2,473	6,192	5,845
USA	1,725	1,694	1,442
Japan	3,380	3,931	3,284
South Africa	2,020	2,676	3,516
Reunion	937	1,179	2,209

## 2. STATISTICS ON ALCOHOL IMPORTS

2.1. The Islands of the Seychelles have only 68-70 thousand inhabitants and most of the alcohol they consume is imported from abroad. Low alcohol fermented beverages such as beer for example are not considered as alcohol in this connection.

Imported distilled beverages (in liters)

	1982	1983	1984
Whisky	96,495	71,047	74,034
Brandy	31,944	32,933	34,171
Gin	16,987	9,564	5,436
Rum	13,489	13,612	10,412
Liquors	5,370	5,825	6,270
Other distilled alcoholic beverages and extracts	5,444	16,121	22,725
	<hr/>	<hr/>	<hr/>
	169,729	149,102	153,048

Although whisky, gin, rum, e.g. imports are decreasing, the figures on liquors and similar distilled alcoholic beverages are increasing fast. In 1982 only 10,814 l, in 1983 already 21,946 l and in 1984 almost three times as much - compared to two years before - i. e. 28,995 l were imported.

The interest for liquors is apparently increasing and this is a field where profit could be made if part of these beverages could be produced locally instead of being imported.

2.2. Besides high-percentage alcoholic beverages alcohol is also imported for other objectives.

Imported ethyl alcohol at a percentage higher than 80% (in liters)

	<u>Denatured</u>	<u>Undenatured (Neutral)</u>
1982	1,680	3,975
1983	17	2,128
1984		6,170

In 1984 there were no separate figures for denatured and undenatured ethyl alcohol available.

If the imported high-percentage alcoholic wines and vermouths are also considered, the total amount of liquor-type beverages is increasing significantly, as can be seen from the following figures:

	1982	1983	1984
Fortified Wines (Port, Sherry, etc.)	48,471	42,779	89,226
Vermouths	84,145	68,324	65,861
	<u>132,616</u>	<u>111,103</u>	<u>155,087</u>

By adding up distilled alcoholic beverages and fortified wines, the total imports of high-percentage alcoholic beverages by this country are around 300,000 liters per year, which is a significant amount for a small country. Probably most of this high-percentage alcoholic beverages are bought by tourists visiting the Seychelles.

### 3. AGRICULTURE

The Seychelles are located at 4° south to the equator and tropical fruits are produced there all year round since there is no winter season. On the Islands the following fruits can be found:

Passion fruit, coconut, mango, papaya, guava, banana, pineapple, golden apple, lime, orange, zambrosia, maliapple, tamarind. Some of them in very large quantities, as for example the coconut, passion fruit, lime, golden apple or ruff orange. The other fruits are being planted by the state-owned company Seychelles Agricultural Development Company (SADECO).

The mainly consumed fruits on the Island cost around R 1.75 per kilo and lower crop fruits around R. 3.00 per kilo. Production of larger quantities of tropical fruits depends on the market demand and the farmers would be able to produce more if the market for their fruits existed.

There is a fruit and vegetable processing plant in Mahé (N.A.I.L.) which is Government-owned and is producing fruit juices, jams, jellies, pulps, etc.

### 3.1. Problems to be solved in agriculture

The Seychelles have two main problems to be solved in agriculture. The first one is the fruit bat which is eating most of the fruits that are being produced and which must be controlled immediately. The second problem is the soil fertility; because of the Island granitic origin, the soil formation is young and rains are washing the soils frequently, which results in a poor mineral content and low pH soils. In order to obtain good crops the soil pH has to be corrected with lime and "guano", an organic fertilizer, or imported mineral fertilizers should be used. Table 1 shows tropical fruits available on the Islands, the time of the year when they are being harvested and the current prices at which they are being sold to N.A.I.L. (fruit and vegetable processing plant).

Table 1 - Tropical fruits in the Seychelles

Tropical fruit:	Harvesting period:	Price/kg:
Passion fruit	10 months/year	R. 3,00
Mango	November	R. 3.00
Orange Mozambique	July/November	R. 1.75
Banana	All year round	R. 0.85
Pineapple	December/January	R. 6.00
Golden apple	Jun/Ju <sup>n</sup> and Jan/Feb	no data
Guava	April and September	R. 2.60
Coconut	All year round	R. 0.50/ each(250g pulp)
Lima	8 months/year	R. 1.75
Tamarind	July/August	no data
Mali apple, Sour sop, Zambrozia	no data available	no data
Jamalak	no data available	R. 2.00

### 3.2. Sugar cane production

Sugar cane agriculture has already been studied in the Seychelles several years ago. In some experiments the yield was 70 tons/ha, but the Brix was as low as 11-14°. According to information received from the Agriculture Department the crop yield in the Seychelles is around 30-40 tons per hectare and the sugar content around 14° Brix.

Under Brazilian conditions sugar cane produces an average of 80 tons per hectare with 18° Brix maximum and alcohol production in big distilleries is 70 liters per ton of sugar cane. In smaller Brazilian distilleries the alcohol yield is only 50 liters.

If we consider sugar cane with 14° Brix and a production yield of 40 tons per hectare, we can expect an alcohol production of 1500 liters - 96 % concentration per hectare in the Seychelles, which is around one third of the Brazilian yield.

According to the import figures of alcohol one can conclude that sugar cane necessities would be 10 hectares at the beginning and 30 hectares at the end of three years.

After visiting SADECO farms and getting in contact with technicians, Barbarons has turned out to be the best place for installing a sugar cane production plant and distillery, because the land is flat and suits the requirements of these quantities. Barbarons farm has already one sugar cane mill with a 10 Hp electric motor and three rolls with following dimensions: Diameter = 25 cm, length = 40 cm (manufacturer Fletcher-Stewart Ltd. Glasgow)

This mill could easily crush the necessary raw material needed for alcohol production and the site has the facilities to install the required fermentation tanks and distillation equipment. Vinasse could be used to fertilize the sugar cane producing soils, since the production would be small and the distribution cost would be low and feasible.



4. N.A.I.L. FACILITIES (National Agro Industries Ltd.)

This factory was initiated 2 years ago and the basis for this project was a UNIDO report prepared in 1980, when the Seychelles were visited for the first time.

N.A.I.L. has a production capacity for 1200-1500 tons per year of finished fruit and vegetable products. Around 600-800 tons are being processed per year. According to the Principal Manager, Mr. Ahlock, and his Assistant, Mr. Stevenson, there is extra capacity for fruit reception and juice production. Steam, water, electricity, equipment and manual labor are available and the liquor plant should be located in this plant, since its facilities could be needed to produce tropical fruit flavoured liquors.

5. CONTACT WITH MR. G. PAYET (Principal Secretary of the Ministry of National Development)

Mr. Payet was made familiar with our idea of producing tropical fruit liquors. It was explained to him that tropical fruit flavours are exotic and delicate and therefore they should be preserved and not be disturbed by off-flavours, such as poor alcohol for example. For this type of liquor the alcohol must be completely neutral in flavour and pH and must also be free from higher-percentage alcohols and fuzel oils. To produce this kind of alcohol long training and accurate fermentation and distilling technology are necessary.

On the other hand 96 % neutral ethyl alcohol of very good quality is available in alcohol producing countries, as for example in Germany, Brazil, South Africa, etc. and it is being offered at very low prices. Right now one liter of the finest alcohol 96 % concentration is being offered on the international market at US\$ 0.45. The Seychelles would not be in a position to produce this kind of alcohol at a similar price.

These reasons lead us to suggest to Mr. Payet that in order to start liquor production as soon as possible, it would be better to import neutral alcohol at the beginning and to produce the tropical fruit liquor with this alcohol. While tropical fruit liquors would then be produced with imported alcohol, the sugar cane production could be started, distillation equipment could be selected and imported, technicians could be trained abroad (in Brazil for example). All these preparations for a national alcohol production would take a minimum of two years; the liquors could be prepared immediately by using the available fruits, processed at the N.A.I.L. plant and formulated with 96 % neutral imported alcohol and refined sugar.

Mr. Payet agreed to this suggestion and was convinced that this would be the best way. He also thought that the Seychelles should try to develop and use national know how in alcohol production technology.

The sugar cane production would use manual labor and would save on import expenditures. The alcohol production would also use manual labor and would be a value added to the Seychelles' economy. The 96 %-alcohol could, apart from being used for the production of liquor beverages, also be used in hospitals, perfumeries, by cleaning agents, etc. The alcohol needs would be around 20,000 liters during the first year and after three years import substitution could be up to 40,000 liters per year.

## 6. PROJECT DEVELOPMENT

Around 20 key persons and technicians were visited, among others:

### 1. Ministry of National Development

- (a) Principal Secretary
- (b) Technology for Development Department
- (c) Agriculture Department
- (d) N.A.I.L. - fruit and vegetable processing plant
- (e) Statistics Department

2. SNCP -- Printing (Labels)
3. Seychelles Potters Cooperative (Bottles)
4. Ministry of Planning and Foreign Affairs  
Principal Secretary

Based on all these visits the following recommendations can be made:

The Seychelles liquor plant should be established in two phases:

(a) Production of tropical fruit liquors (first phase)

By importing 96 % neutral alcohol during the first two years. N.A.I.L. could use its facilities for fruit juice or pulp production. Next to the fruit and vegetable plant new premises with 100 m<sup>2</sup> would be constructed and there the liquors would be made.

- Equipment:
- (a) 10 stainless steel tanks, 200 liters each;
  - (b) Filter with  $\pm 0,25$  m<sup>2</sup> filtration area-available at SADECO
  - (c) Pump
  - (d) Stainless steel sieves

N.A.I.L. would contribute with:

- (a) Overhead facilities: administration, sales, control, fruit and other raw materials acquisition, etc.
- (b) Bottling, labelling, cartoning;
- (c) Storage and distribution;
- (d) Laboratory for quality control and development;
- (e) Boiler, electricity, water supply, sewage, cooling facilities.

At this liquor plant the Seychelles would develop new liquor flavours according to tourists' taste and attitudes, would build up and dimension the potential market, could train specialized technicians without high investment at the beginning.

(b) Production of 96 % neutral alcohol (second phase)

After step one the Seychelles Ministry of National Development would develop step two, which is the national production of 96 % neutral alcohol and probably refined sugar.

For the second phase it is necessary that the sugar cane agricultural production practices be developed where good varieties can be selected, especially from tropical climates (4-6° south of the equator), and the manual labor be trained.

At the same time the distillery would be established at the Barbaron state farm. Equipment would be selected and purchased, transported and installed. Technicians would be trained abroad to obtain the know how for the 96 % neutral alcohol production and control. N.A.I.L. laboratory would be supplied with equipment for alcohol production control.

We recommend that this second phase be started after the liquor market is established and a feasibility study has been prepared which will be about two to three years later.

Necessary Equipment

- (a) 2 fermentation tanks (concrete), 5,000 liters;
- (b) Maintenance of sugar cane mill;
- (c) Distillation equipment (batch-type) 300-500 liters flask;
- (d) Rectifying column for 100-200 liters distillate per day;
- (e) Bagasse furnace boiler (200-300 kg/hr) steam;
- (f) Storage tank - 10,000 liters capacity;
- (g) 20 stainless steel 200 liter drums.

(c) Auxiliary industries

Labels

Labels would be printed in the Seychelles at SNPC (Seychelles National Printing Co.). Art work would probably be developed outside but Seychelles' artists would possibly be prepared to do it. Printing facilities are already developed in the Seychelles and SNPC is well equipped for this purpose. The cost for 1,000 labels would amount to R. 100-150. Art work costs are R. 10,000 to 20,000. Plates' cost is R. 120 each and four are needed.

Bottles

The Seychelles do not have a glass bottle production. Seybrew, the beer manufacturer, import their bottles from England or France. The costs are very high, but may be this is the solution.

We visited the Seychelles Potters Cooperative; they can produce only 250 bottles per month at their present capacity. Bottles are hand-crafted and very attractive, this is something which would attract the potential tourist buyer. Cost of this ceramic bottle is around R. 50 each (one liter).

Another idea, according to Ms. Jorre, would be to develop in the Islands the art of glass-blowing, where special designs could be developed. It is not known if the Seychelles have the right raw silica material for glass-blowing; research is needed.

Sugar

Sugar is being imported by the Seychelles and also by N.A.I.L.; the cost is R. 4.60/kg. Probably this raw material would follow the same development as the alcohol production: First step: Importing

Second step: National production.

Other facilities

Labor cost	R. 1,108/month + 10 % S.S.
Labor Supervisor	R. 2,350/month + 10 % S.S.

Boiler Attender	R. 2,865/month + 10 % S.S.
Supervisor	R. 3,775/month + 10 % S.S.
Assistant Manager	R. 4,380/month + 10 % S.S.
Manager	R. 6,630/month + 10 % S.S.
Water cost	R 6.70 m <sup>3</sup>
Electricity	R. 1.38/kWh
Diesel	R. 4.00/liter

Additives

Citric acid	R. 19.20/kg
Ascorbic acid	R.158.02/kg

Flavourings:

Passion fruit	R. 45.46/500 ml
Orange	R. 28.21/500 ml
Mango	R. 39.46/500 ml
Pineapple	R. 32.60/500 ml
Lime	R. 98.65/500 ml
Lemon	R. 32.59/500 ml

Colouring	R.130.00/kg
-----------	-------------

Investor

According to Mr. Payet it would be their responsibility to find a prospective one and probably the plant - if located next to N.A.I.L - would be Government-owned.

7. PROGRAMME CONCERNING FURTHER TECHNICAL ASSISTANCE

1. A statistic survey on alcoholic beverages consumption by the local population and the tourists is needed (hotels, restaurants, night clubs, duty free shops, supermarkets, families, etc.). This survey must cover various types of alcoholic beverages, e.g. whisky, cognac, liquors, gin, rum, vodka, vermouth, fortified wines, etc.

2. Sugar cane production experiments
  - (a) Varieties
  - (b) Agricultural practices
  - (c) Yield per hectare and final Brix
  - (d) Production costs
  
3. Tropical fruit liquor production costs and technology:
  - (a) C.I.F. imported neutral 96% alcohol;
  - (b) Bottles, caps, labels, carton boxes, other containers;
  - (c) Imported additives' costs: flavours, colours, antioxidants;
  - (d) Imported co-adjuvants: filter aid, bentonite, activated carbon;
  - (e) Tropical fruit juices and pulp costs and technology;
  - (f) Tropical fruit liquor technology.
  
4. Sensorial evaluation of the developed liquors and acceptance by tourists and the local population, based on statistical material.
  
5. Project for a liquor plant
  - (a) Investment
  - (b) Raw materials
  - (c) Construction (building)
  - (d) Equipment
  - (e) Auxiliary equipment
  - (f) Facilities (water, steam, electricity, vacuum)
  - (g) Technology and trained manual labor
  - (h) Costs and capital needed
  - (i) Enterprise identification.
  
6. Project for a sugar cane alcohol production plant
  - (a) Agricultural raw material: Yield and costs
  - (b) Construction (building)
  - (c) Equipment
  - (d) Technology and trained technicians
  - (e) Auxiliary equipment (boiler, electricity, water)
  - (f) Investment cost and enterprise identification
  - (g) Final cost.

7. Possibility of a local bottle production (e.g. glass-blowing)

- (a) Study of local raw material available
- (b) Technology, know how
- (c) Manual labor training
- (d) Investment cost and enterprise identification
- (e) Equipment and auxiliary equipment
- (f) Final cost.



ANNEX I

LIST OF PEOPLE CONTACTED

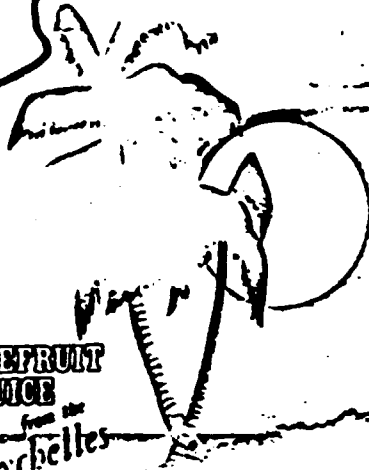
Mr. C. Payet	Principal Secretary, Ministry of National Development
Mr. S. Gendron	Chief Technology for Development Officer, M.N.D.
Mr. R. Weber	Technology for Development Officer, M.N.D.
Mr. M. Delpech	Manager, SADECO
Mr. D. Ahlock	Manager, S.M.B., Fruit and Vegetable Processing Division
Mr. M. Stevenson	Product Manager, N.A.I.L.
Mr. M. Mallie	Statistics Division, M.N.D.
Mr. B. De Smidt	Supervisory Manager, Seychelles Potters Cooperative
Mr. T. Nimigan	Manager, Seychelles Potters Cooperative
Mr. A. St. Ange	Manager, Rieff Hotel
Mr. F. Kwast	General Manager, U.W.E. (Perfumery)
Mr. L.P. Gopal	Manager, Director, S.N.P.C. (Labels)
Mr. J. Nourrice	Principal Assistant Secretary, M.N.D.
Mr. Chanatising	Manager, Department of Agriculture, M.N.D.
Ms. D. de St. Jorre	Principal Secretary, Ministry of Planning and Foreign Affairs

# Tropic

ANNEX II  
SEYCHELLES PRINTED LABELS



GRAPEFRUIT  
JUICE  
from the  
Seychelles



PRODUCE OF SEYCHELLES

Seychelles

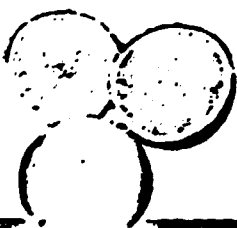
INGREDIENTS  
Pure grapefruit juice

NET CONTENTS  
1.2 l

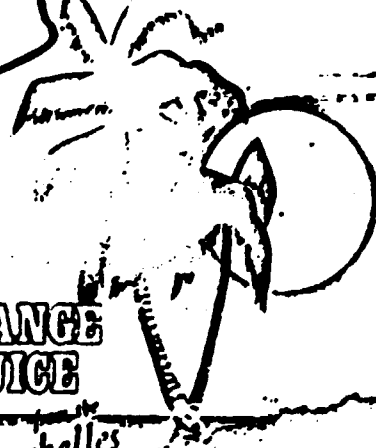


PRODUCT OF SEYCHELLES  
REGISTERED TRADE MARK

# Tropic



ORANGE  
JUICE  
Seychelles



PRODUCE OF SEYCHELLES

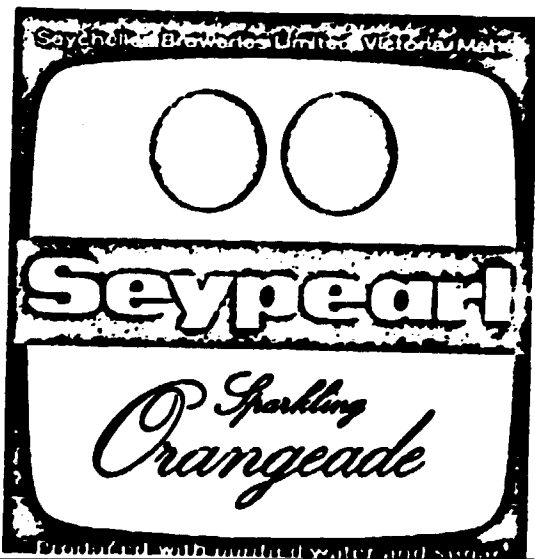
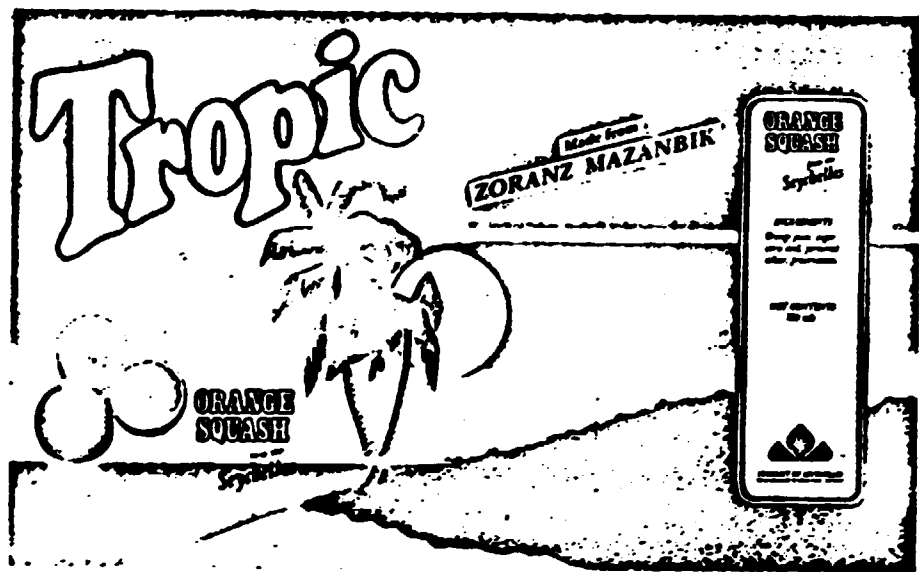
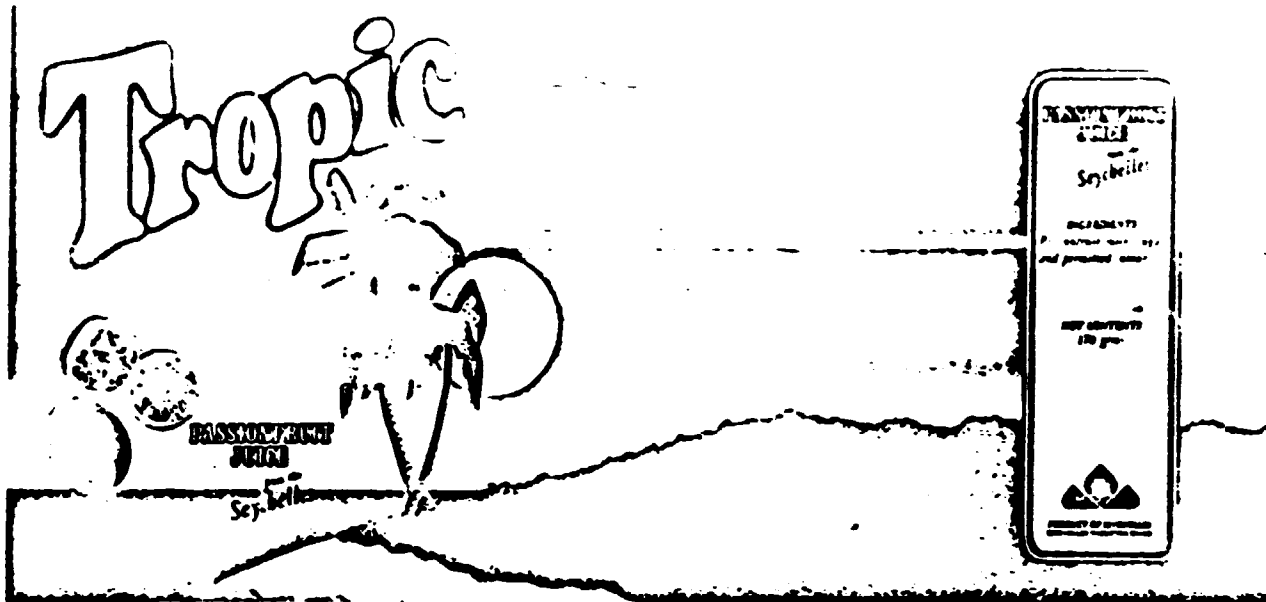
Seychelles

INGREDIENTS  
Pure orange juice

NET CONTENTS  
1.2 l



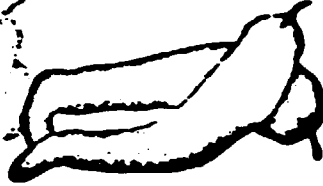
PRODUCT OF SEYCHELLES  
REGISTERED TRADE MARK



*Ingredients*  
Tomato Paste, Sugar, Salt, Capsicum (Chilli),  
Spices, Permitted Food Colours and Preservatives

400 grams

**Soleil**  
**Chilli Sauce**



Product of  
SEYCHELLES MARKETING BOARD

**Soleil**  
**Chilli Sauce**



*Ingredients*  
Tomato paste, Sugar, Salt, Spices,  
Food acid and permitted preservatives

400 grams

**Soleil**  
**TOMATO SAUCE**



Product of  
SEYCHELLES MARKETING BOARD

**Soleil**  
**TOMATO SAUCE**



ANNEX III

LIQUOR FÓRMULAS

LIQUEUR- CHERRY BRANDY

(Divers)

Cherry Brandy 50.390/C 100g. % litres  
20 litres alcool fin de bouche 95°  
15 litres alcool de vin 74°  
30 Kgs. sucre  
400g. acide citrique eau jusqu'à 100 litres

M. Gros 13.4.1965

Cherry Brandy (base genre Wynand Focking)  
50cc. alcool de vin 74°  
340cc. alcool fin de bouche 95°  
300cc. sirop de sucre glucosé 20 %  
410cc. eau  
5cc. acide citrique à 50%

LIQUEUR CURACAO

(Divers)

Curacao 50.397/C 100g. % litres  
ou " 50.890/C  
ou " 50.891/C  
472cc. alcool de vin 74°  
350cc. sirop de sucre 65% } 35° environ  
178cc. eau

LIQUEUR-BITTER anglais

Bitter anglais 50.405/C 100g. % litres  
300cc. alcool fin de bouche 95°  
370cc. alcool de vin 74°  
150cc. sirop de sucre 65% } 40° environ  
380cc. eau

M. Gros 13.4.1965

LIQUEUR ANANAS

(Divers)

Ananas 50.167/C 100g. % litres  
200cc. alcool fin de bouche 95°  
80cc. alcool de vin 74°  
300cc. sirop de sucre 65% } 25° environ  
420cc. eau

LIQUEUR CAFE

(Divers)

Café 50.439/C 140g % litres  
250cc. alcool fin de bouche 95°  
400cc. sirop de sucre 65% } 25° environ  
350cc. eau

LIQUEUR PRUNELLE

(Divers)

Prunelle 51.738/C 100g. % Kgs.  
300cc. alcool fin de bouche 95°  
350cc. sirop de sucre 65% } 30° environ  
350cc. eau

LIQUEUR KUMMEL

(Divers)

Kummel 50.702/C 50g. % litres  
300cc. alcool fin de bouche 95°  
80cc. alcool de vin 74°  
300cc. sirop de sucre 65% } 35°  
320cc. eau

LIQUEUR BANANE

(Divers)

Banane 50.213/C 100g. % litres  
200cc. alcool fin de bouche 95°  
80cc. alcool de vin 74°  
300cc. sirop de sucre à 65% } 25° environ  
420cc. eau

M. Gros 13.4.1965

Liqueur crème à 22°  
 M. Hanke  
 Alcool fin de bouche à 96° 23 cc. 15% Vodka  
 Sirop de sucre 30° B<sub>6</sub> 35 cc. 10% Sucre  
 Eau 42 cc. 75% Eau distil  
 liqueur 15°

Liqueur à 40° (Triple sec)  
 Alcool fin de bouche à 96° 41,5 cc.  
 Sirop de sucre 34° B<sub>6</sub>, froid 46,5 cc.  
 Eau 12 cc.

Liqueur à 35°  
 Alcool fin de bouche à 96° 27 cc.  
 Sirop de sucre 65 % 32 cc.  
 Eau 31 cc.

Liqueur à 37°  
 Alcool de vin 74° 50 cc.  
 Sirop de sucre 65 % 40 cc.  
 Eau 10 cc.

Liqueur sans acidité  
 Sirop de sucre 65 % 30 cc.  
 Eau 40 cc.  
 Alcool fin de bouche 95° 30 cc.

LIQUEUR ABBATIALE (Divers)

Abbatiale c.v. 50.414/C Type chartreuse verte:  
 100g. % litres

Alcool de vin 74° 270 cc.)  
 Sirop de sucre 65 % 175 cc.) 40° env.  
 Eau 55 cc.)  
 Couleur vert-jaune

Abbatiale 50417/C Type chartreuse jaune:  
 100g. % litres

Alcool de vin 74° 270 cc.)  
 Sirop de sucre 65 % 175 cc.) 35° env.  
 Eau 89 cc.)  
 Couleur jaune et 4 touches de caramel

Abbatiale B 50.418/C Type Bénédicte:  
 100g. % litres

Alcool de vin 74° 236 )  
 Sirop de sucre 65 % 175 ) 35° env.  
 Eau 89 cc.)  
 Couleur brun-jaune.

M. Gros 12.4.1965

LIQUEUR genre DRAMBUIE (Divers)

0,5 g	Arôme pour liqueur	300.452 B.
230,0 cc	Whisky type "Scotch"	
230,0 cc	Alcool fin de bouche 96°	
390,0 cc	Sirop de sucre 65%	
149,5 cc	Eau	
1000 cc		

Colorer avec du sucre caramélisé.

LIQUEUR ABRICOT (Divers)

Abricot 50.037/C 100g. % litres:

200cc. alcool fin de bouche 95°  
 80cc. alcool de vin 74°  
 300cc. sirop de sucre 65 %  
 420cc. eau  
 25° environ

M. Gros 12.4.1965

Abricot brandy 50.934/C 100g. % litres Type Bols

50cc. alcool de vin 74°  
 280cc. alcool fin de bouche 95°  
 300cc. sirop de sucre glucosé 20%  
 370cc. eau  
 2cc. acide citrique à 50%

M. Gros 13.4.1965

Liquor avec acidité

de sucre 65 % acidulé	15 cc.
de sucre 65 %	15 cc.
	40 cc.
l fin de bouche 95°	30 cc.

M. Gros 14.4.1965

Liquor douce basée sur la vodka:

40°	250 cc.
simple 65 %	200 cc.
distillé	50 cc.
citrique à 50%	1 cc.
concentration C	0,5cc.
ur	q.s.

Dolder 26.10.1965

LIQUEUR TRIPLE SEC

(Divers)

sirop de sucre froid 34° B <sub>é</sub>	27 litres
alcool de vin 71°	24 "
au de fleur d'oranger	3 "
esprit d'orange 80°	8 "
" de citron 80°	2 "
	<hr/>
	64 litres

branché 1 heure à 70°, fait 10 parties

M. Gros 12.4.1965

Triple sec 50.406/C 100g. % litres	
alcool fin de bouche 95°	300 cc.
alcool de vin 74°	80 cc.
sirop de sucre 65 %	350 cc.
compléter à un litre avec de l'eau	

M. Gros 13.4.1965

Triple sec 50.406/C 100g. % litres	
alcool de vin 74°	35 litres
sirop de sucre 65 %	35 "
u	30 "
	M. Gros 13.4.1965

Cognac à 60°	4,400 litres
Cognac vieux à 39°	5,600 "
Esprit distillé d'orange à 82°	2,800 "
Eau de fleur d'orange quadruple	2. --- "
Orange alcoolat-infusion	0,140 "
Caramel blind	2,800 Kgs.
Sucre blond à 30°	0,800 "

18,540 litres

Cela donne environ 17 litre à cause du sucre.

(Divers)

Framboise 50.954/C 200g. % litres  
 250cc. alcool fin de bouche 95°  
 350cc. sirop de sucre 65%  
 10cc. acide citrique 50%  
 Compléter à un litre avec de l'eau

LIQUEUR PRUNELLE

Prunelle 51378 C 100g. % litres  
 300 cc alcool fin de bouche 95°  
 350 cc. sirop de sucre 65%  
 350 cc. eau  
 30° environ  
 M. Gros 13 AVR 1965

GRAND MARNIER

(Divers)

Cognac nature 60%	4,400 litres
Cognac 1848 39%	5,600 "
Distillation esprit d'orange	2,800 "
Eau de fleur d'orange	2. --- "
Orange alcoolat extra zeste	0,140 "
Caramel Blond	2,800 "
Sucre blanc	0,800 "

18,540 litres

Ne donnera que 16 à 17 litres à cause du sucre

M. Gros 12.4.1965





## UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

## UNIDO

Project for the Government of the Republic of Seychelles

## JOB DESCRIPTION

UC/SEY/84/158/11-01/31.7.C

Post title

Expert in alcoholic beverages

Duration

Three weeks

Date required

As soon as possible

Duty station

Seychelles

Purpose of project

To ascertain the basic information needed to decide if a full study should be made to industrialize available raw materials to produce alcoholic beverages both for the local and export market.

Duties

The expert will be expected to:-

- collect information needed to elaborate and justify a project of technical assistance aimed at locally producing liquor from tropical fruit;
- assess the main data concerning the market;
- identify potential interested investors; and
- elaborate a detailed programme concerning further technical assistance requirements.

The expert will also be required to prepare a technical report setting out the findings of his mission and recommendations to the Government on any follow-up action which might be taken.

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Applications and communications regarding this Job Description should be sent to:

Project Personnel Recruitment Section, Industrial Operations Division  
UNIDO, VIENNA INTERNATIONAL CENTRE, P.O. Box 300, Vienna, Austria

**Qualifications**

Expert in alcohol production with substantive knowledge in fermentation and distillation technology and equipment and with experience in processing different raw materials.

**Language**

English

**Background Information**

The alcoholic fermentation of fruits in the Seychelles is no secret. This "most" or "baka" as it is locally known has been produced from every known fruit that grows in the Seychelles. The fermentation process is caused by the natural yeast and bacteria found on the ripened fruit or in the air, no yeast is added and once the fermentation has stopped, the wine is drunk more or less straight away without any clearing and settling of sediments, or any further treatment.

Alcoholic fermentation is the first step in the process of making liquor. The second step is the distillation of the "most" to obtain the alcohol plus various aromatic compounds which provide the body and the odour of the spirit. The process of distillation is not so well known in the Seychelles although some local people carry out the process producing what is known locally as "ronm" (rum). The distillation is usually carried out in a copper boiler attached to a condensing copper coil placed in a water jacket. The final product is tested by flaming, and any distillate that does not ignite is not collected. The end result is totally dependent on the experience of the distiller. Local trials have shown that, "Ronm Fridsiter" (The distillate from fermented golden apples) has the best taste.

Many Indian Ocean States such as Reunion and Mauritius produce their own alcoholic spirits which are very popular for the tourist and imply an important contribution to their economy. Both countries also export considerable amounts of their alcoholic drinks.

In the Seychelles there is currently no local marketed "liquor" which the tourist can buy and consequently there exists a potential market for such a product. This project therefore is aimed at producing a liquor especially for the tourist sector of the Seychelles economy. Therefore, the Energy and Technology Unit (Ministry of Foreign Affairs) in Point Larue has been assigned by local authorities to develop an alcohol liquor from "Fridsiter" which should meet the international requirements of brandy.

The develop a standard quality product, the necessary technology and knowledge is not available in the country and this is why UNIDO has been approached for assistance in developing and transferring this technology.