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ASSISTANCE TO THE ESSENTIAL OIL INDUSTRY - ZANZIBAR

DP/URT/86/026

UNITED REPUBLIC OF TANZANIA

Technical report: Maximizing the capacity of the clove distillery of Chake Chake, Pemba*

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

Based on the work of Mr. A.M.A. Abeysinghe,
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EXECUTIVE SUMMARY

The downward trend in the Zanzibarian economy, in the face of rising population, and the decline in agricultural production that of cloves, affected the volume of imports, especially with the import liberalization. Zanzibaran export trade is almost totally dependent on cloves. This characteristic makes it imperative to diversify into other exportable crops from a mono-crop economy which is often subjected to fluctuations in prices. Apart from cloves, Zanzibar has undertaken at various times work on chillies, pepper,ginger, tumeric, nutmeg and mace, cardamom, lemon grass, vetiver, patchouli, ylang ylang, ocimum, lime,pimento but no follow up action has been done, leaving work on R & D to neglect. A strategy at consolidation of the clove acreage through replanting, rehabilitation, inter cropping, and solving connected land tenure problems, price revisions, and necessary linkages between various donor projects and ZSTC would help the country to maintain its status as a reliable supplier of the product.

(a)
There is a need to streamline the production of clove oils at the distillery through attending to repairs, replacements, electricity and other processing services, in order to facilitate supplies of the products, in time, and in targetted quality and quantities, for marketing of the range of commodities from the distillery. The lack of trained staff and frequent breakdowns generally affect production and thereby marketing.

(b)

There is a need to streamline internal marketing by minimizing the long and time consuming purchasing procedures and provision of marketing information to those concerned including the distillery.

(c)

The overall marketing division of the ZSTC lacks trained staff for for any agressive marketing. They lack linkages with processing and agricultural development. The division lacks marketing service facilities, market information, technical data of the products on offer. The Chief Government Chemist who services the marketing lacks instruments, chemicals training, know how to service existing and potentially new essential oils. The inspectorate of produce suffers from a lack of trained staff. The handling of finished products at the factory go down at Pemba and at export go downs, due to lack of fork lifts results in damage to drums. Shipping delays at Zanzibar is another problem that needs to be resolved.

A strategy of marketing outlined including appointment of four formal agents in carved out geographical areas, production of sales and marketing promotion materials, advertising, TV documentary, participation in Trade fairs and international conferences, using of the Tanzanian embassies to promote products, linkages with international and national essential oil associations, use of import promoting bodies in developed countries, utilizing of the tourist promotion drive to promote products, exploring the posibilities for joint ventures in essential oils are some of

the many strategies outlined.

Prospective products recommended includes product diversification in cloves (Engenol, iso-engenol,vanillin, terpenes, oleoresins), lemon grass, citronella, vetiver, ginger,cardamom, cinnamon, black pepper, palmarosa, in the short run(1990-1992). In the medium terms it is recommended to take up nutmeg,geranium, patchouli,ylang ylang & canaga + artmesia (1992-1995). It is recommended that ocimum oils should be offered to the trade for opinion. The derivatives from ocimum like engenol, camphor be extracted at the distillery and offered to the international market. Ecalyptus, lime, bitter lemon, basil, bay oils,pimento leaf + bud oils, and mint are not recommended.

Whilst pursuing the sales and marketing strategies recommended , it is recommended that the ZSTC pursue the development of recommended essential oil crops in the Nucleus estate of the Distillery with contract farming to be done by outgrowers so that the growth, development and marketing can work according to a plan. This will also help to develop export and marketing strategies for the existing and new essential oils. It is also recommended that ZSTC hire an experienced agronomist available in the country who could also overlook the Kizimbani Experimental stations spice crop section and supply the produce(nutmegs, mace, black pepper,pimento, ylang ylang) to the Pemba distillery for distillation of essential oils and any oleoresins. It is recommended to utilize the recommended four agents in the global market segments to promote the products backed by the sales and promotional strategies outlined.

RECOMMENDATIONS

TO ZSTC

* STREAMLINE THE PRODUCTION OF ESSENTIAL OIL AT THE DISTILLERY THROUGH TIMELY ATTENTION TO OPERATIONAL AND OTHER PROCESSING SERVICES IN ORDER TO FACILITATE TIMELY SUPPLIES OF THE PRODUCTS TO MEET MARKET DEMAND.

* OFFER A PACKAGE OF PRODUCTS TO BUYERS THAN ONE SINGLE PRODUCT FROM THE DISTILLERY.

* STREAMLINE INTERNAL MARKETING BY MINIMIZING LONG AND TIME CONSUMING PURCHASING AND MARKETING PROCEDURES.

* PRIVATIZE INPUT IMPORT AND DISTRIBUTION.

* PROVISION OF AN AGRICULTURAL CREDIT PACKAGE THROUGH THE BANKING NETWORK AND NOT BY ZSTC.

* PROVISION OF MARKETING INFORMATION SERVICES TO INCLUDE OF AGRICULTURE AND DISTILLERY.

* DEVELOP LINKAGES WITH OTHER AGENCIES FOR BETTER COORDINATION.

* PROVISION OF TRAINING TO MARKETING, GOVERNMENT CHEMISTS, PRODUCE DEPARTMENT STAFF AT THE DISTILLERY AT PEMBA.

* UPGRADING AND IMPROVEMENT OF TRUNK AND MARKET ROADS, GODOWNS, DRYING TECHNOLOGY.

* TRAINING OF ZSTC PURCHASING STAFF.

* EXAMINE THE FEASIBILITY OF A PRICE STABILIZATION FUND FOR CLOVES AND OTHER SPICES.

* TREBEL HANDLING OF PRODUCE FROM THE DISTILLERY, SHIPPING DELAYS AND PACKAGING BE RESOLVED AS RECOMMENDED.

* APPOINTMENT FOUR FORMAL AGENTS TO COVER EEC:USA AND AMERICAS: USSR EASTERN EUROPE AND MIDDLE EAST: INDIA AND FAR EAST AFRICAN CONTINENT TO SERVICE AFRICAN MARKETS.

* OPTIMUM UTILIZATION OF THE TANZANIAN EMBASSIES ABROAD WITH FOUR ZANZIBARIAN TRADE COMMISSIONERS IN THE U.K.,SINGAPORE, USA AND A SELECTED MIDDLE EAST COUNTRY.

* UTILIZATION OF BILATERAL TRADE RELATIONS.

* PARTICIPATION IN SELECTED SPECIALIZED TRADE FAIRS, TECHNICAL CONFERENCE WORKSHOPS AND SEMINARS.

* MEMBERSHIP OF INTERNATIONAL ASSOCIATION AND LINKAGES WITH INTERNATIONAL AND NATIONAL ESSENTIAL OIL ASSOCIATIONS.

* INVITATION OF BUYERS/AGENTS TO PEMBA DISTIUERY.

* ADVERTISING AND PUBLICITY.

* UTILIZATION OF THE IMPOD ORGANIZATION.

* PRODUCTION OF A STAMP ON CLOVE DISTILLERY.

* ESTABLISHMENT OF AN AGRICULTURAL CONSULTATIVE GROUP IN ZSTC, APPOINTMENT OF A FULL TIME AGRONOMIST AND ANALYTICAL CHEMIST.

* ESTABLISHMENT OF A NUCLEUS PLANTATION OF THE DISTILLERY AND CONTRACT FARMING .

* RECOMMENDS CLOVE DIVERSIFICATION, LEMON GRASS, VETIVER,CITRONELLA, CINNAMON, CARDAMOM, GINGER,BLACK PEPER, PALMAROSA AND FOR MEDIUM TERM; NUTMEG, GERANIUM, PATCHOULI, YLANG YLANG, and OCIMUM

TO UNIDO

* TRAINING OF MARKETING DIVISION STAFF IN ESSENTIAL OIL DISTILLATION AND MARKETING COMPANIES, MARKETING RESEARCH AND SALES PROMOTION AND TRADE FAIRS.

* ESTABLISHMENT OF A MARKETING INFORMATION LIBRARY AND PROVISION OF MARKETING SERVICE FACILITIES.

* ASSISTANCE TO MARKETING FACILITIES THROUGH PROVISION OF FORK LIFTS, TRAINING AND PROVISION OF EQUIPMENT AND CHEMICALS AND LITERATURE TO GOVERNMENT CHEMISTS AND PRODUCE INSPECTORATE.

* PROCURE THE ASSISTANCE OF A PROFESSIONAL PROMOTIONAL FIRM TO PREPARE PROMOTIONAL MATERIALS.

* PREPARATION OF A TV DOCUMENTARY FOR PROMOTIONAL PURPOSES.

* PROMOTION OF A JOINT VENTURE FOR DISTILLATION, MARKETING MANAGEMENT AND EXPORT.

INITIATIVE FOR GENERIC PROMOTION OF CLOVE OILS AND CREATING ATMOSPHERE FOR AN INTERNATIONAL CLOVE AND CLOVE OIL COMMUNITY.

CONTENTS

INTRODUCTION

The project 'Assistance to Essential Oil Industry, Zanzibar: Maximising the capacity of the clove oil Distillery of the Chake Chake 'DP/URT/86/026/A/01 37 started from July 1, 1989 with the arrival of Dr. Baldev Gulati, Chief Technical Adviser in Chake Chake, Pemba. This was followed by the visit of Mr. Klaus A Duerback, expert in cultivation of essential oil bearing plants in January, 1990. The quality control chemist Mr. Maheswari visited the Distillery in August, 1989. The exp rt had a brief meeting in Colombo with Dr. B. Gulati, CTA and Dr.R.C.B. Wijesekera of the UNIDO regarding the mission.

In the course of DP/URT/86/026 the marketing Expert was fielded in May-June, 1990, to perform the assignment. The job description is given as per Appendix and it reads, in brief, as follows:-

(a)

Survey the present practices of trade in spices and essential oils in the light of the observations made in the previous UNIDO Report (DP/LD/SER.A/1298) and DP/ID/SER A/1927 of January, 1990).

(b)

Make recommendations in regard to the Marketing and sales Promotion of Essential Oils, with special reference to clove oils;

(c)

Make recommendations on methodologies for streamlining market practices.

Since the UNIDO counterpart agency in Zanzibar is the ZSTC within the Ministry of Trade and Industry, the expert worked closely with the Pemba Distillery and ZSTC staff and within the policy framework established by the ZSTC. Due to the lack of information on the ground situation, the expert proceeded directly from Colombo to the Project site in Pemba , Chake Chake. Investigations began from the farm, farm gate, ZSTC collecting centres, ZSTC Godowns, export point, standardizing godown in Zanzibar, wharf, shipping points and farm gates to distillery godowns. In clove stems through the distillery to export points.

The expert met TDRI/ODA clove Research project personel in Pemba, Kilmo personnel in Pemba and Zanzibar including a visit to Kizimbani Research Project. In Zanzibar the expert met the General Manager, Acting Deputy General Manager Marketing, Shipping, Wharfage, statitics, personnel in the ZSTC, the Ministry of Agriculture, Livestock and Natural Resources, the Ministry of Trade and Industry , Commissioner of Investments, Ministry of Finance,Ministry of Planning, FAO Officials, and other related personnel. On return to Pemba, Chake Chake, the expert had detailed discussions with the Deputy General Manager ZSTC in charge of Pemba operations Mr. Hamadi Hamis at Wete, Clove bud and stem examiners, godown keepers and related staff. The detailed discussion withthe Plant Manager Mr. Nasib S. Omar was very helpful and his assistant Mr. Ramadhan K. Feruz, acting accountant

Mr. S.S. Shukuru was very useful in the work of the mission. The expert visited godowns in Wete, Chake, Chake, Mkoani, and Kilime clove nurseries. Discussion were held with Kilimo Extens ion services, Forestry Project, ODA Research Project, with on officer from the plant always present with the expert to build up linkages to the project in the future, so that in the course of implementation of recommendations close linkages which seems tolack at present , could be built up, for the project success, in its operational stages. The expert worked closely with the Marketing personnel in Zanzibar during his field visits including to the Kizimbani Agricultural Research station where much work has been done at various times on spices and essential oil crops but left to neglect due to no follow up action. Mr. M.A. Ghassan, special adviser of the Ministry of Agriculture and Mr. Yuosuf Hassania, retired Agriculture officer and Mr. Rashid, General Manager ZSTC also had been closely linked with spice and essential oil development in Zanzibar and Pemba were sources of knowledge on the country's spice development and agricultural operations. Their rich experience was very beneficial to the expert during his mission.

1. THE AGRICULTURE AND THE SPICE AND ESSENTIAL OIL SECTOR IN THE ZANZIBAR ECONOMY

1.01: Zanzibar consists of two main Island, Unguja and Pemba,and a number of small Islands (Maps-Annexe). The Island of Unguja and Pemba are about 40 Km. and 60 Km. off the eastern coast of main land Tanzania respectively. Total land area is about 2450 Km 2.(Unguja 1530 Km 2 (Unguja 1530 Km 2 and Pemba 920 Km 2). The population of about 600,000 (350,000 in Unguja and 240,000 in Pemba), grows at annual rate of 2.7/100. Nearly 30% are urban living in towns.

1.02: Agricultural is the most important sector of economic activity accountirg for an average 58% of GDP. It provides employment to 70% of the labour force and is responsible for about 90% of the GDP foreign exchange earnings and 30% of Tax revenue. Subsistance production accounts for about 30% of GDP. The Industrial sector is small. The agro based Industries are limited to the Clove Oil Industries Distillery in Pemba, Lime Juice Oil Distillery in Zanzibar, Sugar industry in Zanzibar. The coconut oil and the dairy project the shares of manufacturing is 5% of the GDP and of the construction only 3.5% of the GDP.

1.03: The economy of Zanzibar has been on a persistently downward trend since the mid-1970's, expressed in 1976 prices, GDP declined from T Shs. 979 Million in 1976 to about T. Tshs. 731 Million in 1977. This represented an average annual fall of 2.6%. The population increase of 2.7% annually has meant that there was a real decline per Capita of production value that there was a real decline per Capita of production value of approximately 5.2% over the same period. Due to the dominant position in the economy, the weak performance of agricultural sector is a major factor responsible for the decline in GDP. From 1976-1987 agricultural output declined by 25% mainly because of falling clove production from about 12,000 tonnes per year. In the 1970's to 4500 tonnes in

1987 and around 2000-3000 tons, in 1990/91. With some exceptions, output in the other sectors of the economy also declined.

In dollar terms GNP per Capita, estimated at US $ 120 in 1987, partly due to the devaluation of the Tanzanian shilling. The annual inflation, between 1980-87 period, as measured by the consumer price Index, average 31-35% demestic prices in Zanzibar are strongly influenced by the variations in the price of imports. Before 1984, imports form Mainland Tanzania had the most significant influence on local prices, with the import liberalization policy adopted in 1984, imported goods have become a more significant determinant of inflation.

1.04 Zanzibar's export trade is almost totally dependent on cloves its share in export earnings from 66.9(1983)% to 47(1987)% export earnings fell considerably in 1983 and 1984 when Indonesia, the principal market for cloves, ceased imports from abroad and in 1986 because of the substantial decline in world prices. Value of exports averaged some US $ 43 Million in the 1978-82 period it declined to US $ 8 Million in 1989/90. Exports of the other commodities such as copra, coconut oil, seaweed and seashells are negligible.

1.05 The structure of imports favours consumption items, with food comprising some 42% of imports. Imports of rice, wheatflour and sugar a coconuts for bulk of total food

imports. This has declined mainly because of reduced foreign exchange earnings and the drive towards food self sufficiency under the Zanzibar economic recovery programe. The removal of the rice subsidies also has contributed to the reduction im import level and encouraged local production of rice. The volume of rice, wheat flour and sugar imports averaged some 40,000 tons, 14,000 tons,and 9000 tons annually (1984-1987). It has declined to only 16400 tons of rice 3500 tons of wheat flour, 8000 tons of sugar in 1988 and to 29,000 tons of rice 15000 tons of wheat flour and 9000 tons of sugar in 1989.

1.06 Small holder mixed farming dominate land use in Zanzibar. Two major farming systems can be distingushed, the semi-plantation agricultural zone on the more fertile areas of both islands and the more marginal coral rag. The total cultivable area of the semi-plantation zone is 130,000 of which 85% (110,000) the under crop production leaving little opportunity for expansion. In the 'Coral rag' area less than 20% is cultivated. Fishing supplements family incomes in most areas.

1.07 About 60% of the total cultivated areas is planted to food crops, cassava, grown universally in every rural household, is the most important crop followed by banana sweet potatoes,legumes and maze. Rice is grown wherever there is suitable land. Except for rice, all crops grown are intercrops, mixed crops and in complex associations, often under tree crops. Agricultural productivity is low

and agricultural expansion is constraint. Agricultural practices and interacted agricultural package has not developed and no follow up of most research is not done due various constraints. Agricultural extension is virtually non-existent in spite of a army of field staff without proper mobility facilities.

1.08 The cash crops are:

(i) Export crops , of which cloves and coconut are the most important;

(ii) Potentially exportable crops such as fruits, spices (chillies, ginger,pepper,nutmeg, tumeric, pimento, cardamons, cinnamon) nuts and beverages (coffee and cocoa)

(iii) Potentially exportable essential oil crops (lemon grass, cinnamon leaf, clove leaf, vetiver, ylang etc.)

(iv) Import replacement crops.(Rice, sugar etc.)

1.09 Livestock is of monor importance to the rural household of Zanzibar. In 1988, 29% of the house-holds on Unguja had poultry, 11% had cattle and 6% had goats. In Pemba 65% of household had poultry 37% cattle and 10% goats. Wood and charcoal area the most common source of energy. Domestic wood sources including coral rag thickers, mangrove areas, village plantations, agricultural clearings, coconut and clove trees.

1.10 The clove tree is indigenous to the Molucaas (The Ambayana Island) in Indonesia but is now found widely in the

South and South East Asia, in a number of India Ocean Islands, in West Indies and Latin America, in parts Africa and has been introduced to some Oceanic Islands.

1.11 It is documented that in 1769, the French navigator Peirre succeed in transporting clove plants from the Moluccas to the French Bourborn Islands (Reunion) and Isle de France (Mauritius) from where the British East India Company took it to Penang Islands off the coast of Malaysia. French observers attributes the first person to extract clove oil was M. Sausse , a creole from the Mascarenes, who is known to have been trading slaves since 1785.Zanzibar tradition atributes the introduction of cloves to Saleh B Haramil al abray who appears to have been the doyen of the Oman merchant class. He accompanied by a French Officer from Zanzibar to Bourbon at the end of the 18th century and obtained permission to take back a small quality of clove seeds and plants with him. Those were planted at Mtoni and Kisimbani in 1812. Seyyid Said of the Omanian merchant class confiscated Saleh's properties in 1828 . It is from these plantations Said began to develop cloves. Between 1823-24 Bombaywas importing small quantitiesof cloves from Zanzibar. Pemba began to heavy planting of cloves after 1872. Cloves was introduced by the British to Sri Lanka from the Kew gardens in the U.K. At present cloves are grown in the following countries.

Asia - Sri-lanka, India, Indonesia, Malaysia.

Pacific - Papua New guinea; Irian Jaya; Phillipines.

Africa - Zanzibar, Pemba, Madagascar, Muritius, Comoros, Sierra Leone, Uganda, S. Africa, Seychelles.

Carribeans- Jamaica, Grenada.

Latin America- Paraguay, Brazil.

Until 1950's the World production and exports was dominated by two countries. More recently significant changes have occured in the production, processing, and marketing scenario. New trends are evident in production countries and several joint ventures are being operative in production, processing and marketing of clove and clove based products.

1.12 Current international production of clove buds is around 55,000-60,000 tonnes per annum and significant amount of clove stems and mother of cloves. A major portion of stems are either consumed, or used for distillation or not collected in producing countries. 70% of the world production is domestically consumed in Indonesia mainly in the Kretex cigaratte industry. In quantitative terms, it varies from 38,500-42,000 tonnes.

1.13 The international markets for spices is estimated at around 296,000 to 327,000 tonnes. In value terms it is US $ 694-781 millions.(1978-1981 Averages:ITC). Roughly 12,000-20,000 tonnes of clove buds enter international markets, clove spice mainly in the form of buds. This is

4.05% to 6.2% of the total volume of spices traded internationally. In value terms, at current prices it is US $ 48-80 million which is 7-10.2% of the total value of all spices traded.

1.14 The major suppliers of cloves as a spice are as follows:

Madagascar	30 - 10,000 tonnes
Zanzibar and Pemba	4000 - 12,000 tonnes
Comoros	350 tonnes
Brazil	1000 - 2,000 tonnes
Indonesia	100 - 150 tonnes
Sri Lanka	800 tonnes
Malaysia	100 tonnes

1.15 Thus, the market leaders in clove spice markets are Zanzibar and Madagascar followed by Brazil. Although, Singapore appears in international trade statictics as an enterpot function of Zanzibar Indonesia, and Malaysian cloves. The main importers of clove buds are as follows:

EEC Market	2000-3000 tonnes
Eastern European (Comecon markets)	400- 500 tonnes
Other Europe	400- 600 tonnes
North and Latin America	1800-2200 tonnes
Africa and Middle East	1500-2000 tonnes
Far East and Oceania including Indonesia	10,000-11000 tonnes

1.16 The clove leaf oil is an essential oil obtained by distillation of the clove leaves and twigs of the clove tree. Clove stem oil is distilled from clove stems which are by-products of clove bud harvesting. The clove bud oil is steam distilled from dried buds of the clove trees. Of all the clove oils clove leaf oil is the major traded oil. International trade in all types of essential oils is recokned to be around 43,627-45,000 tonnes. Of this clove oil is about 3500 tonnes or 5% - 8% of the internationally traded oils.Of this clove leaf oil international trade is 1800-3000 tonnes or 90.9%. Thus, clove leaf oil is, by far, the largest traded clove extract. Indonesia and Madagascar are the dominant suppliers. Sri Lanka is a minor supplier of clove leaf oil, Zanzibar and the Comoros do not produce clove leaf oil. Since, clove leaf is not exported for distillation of oil, there is no production of clove leaf oil in the EEC or the USA.

1.17 The major markets for clove leaf oil are the USA and France. Each country absorbs about 2.5 - 3.5 of total world imports. The import to the USA markets tended to decline from 849 tonnes in 1980 to 392 tonnes in 1983. However, from 1986 quantities have increased from 739 tonnes in 1986 to around 677 tonnes in 1987. A decline was a-gain seen in 1988 when only 440 tonnes were imported. The reasons for this trend are ascribed to:

(a) An increase of clove oil eugenol and iso-eugenol imports principally from Indonesia in perference to crude clove leaf and clove bud oil. Indonesian export increased from 30 tonnes in 1970 to 100 tonnes in 1982.

(b) Imports of eugenol from France, Federal Republic of Germany and Netherlands.

Indonesia is now the market leader replacing Malagasy Republic whose export to the U.S.A. would decline due to trade preference for clove engenol and iso-eugenols.

1.18 The international trade in clove bud oil is in the range of 40-50 tonnes. In terms of clove buds it is 10526-13200 tonnes. The highest quality of bud is generally not used in clove bud distillation.

1.19 The international production of clove stem oils is much larger than the clove bud oil. The international trade of clove stem oil is reckoned to be around 100-150 tonnes per annum. The main supplier in the late 40's and early 50's was Zanzibar but since Zanzibar ceased supplies in early 80's , the gap in the demand and supply was met by increased supplies from Madagascar, France, Comoros, and Sri Lanka coupled with greater demand for clove leaf oil which was cheaper than clove stem oil.

1.20 Clove oleoresins are produced by solvent extraction of clove buds and clove stems. It is employed as an alternative to the ground spice in processed foods. The international market is recokned at 15-20 tonnes. The United States produces 5-10 tonnes annually, the United Kingdom 2 tonnes annually, and small quantities are manufactured in France, the Netherlands, Canada, Singapore and Japan. The largest market is the U.S.A. which consumes 50% of the world supply. Remainder is consumed in the EEC markets of the U.K., the FRG and in Japan. Compared to the international oleoresin markets of all types which in volume is 1400 tonnes annually, clove oleoresins are one of the lower volume oleoresins.

1.21 Cloves are among the most highly priced internationally traded spices. An analysis of price trends since 1977 reveals a price range between $ 3500-$ 6455 per tonne in the U.S.A. markets. Price level vary from time to time from various origins. The current prices are at around US $ 4000-4500 per tonne. The price fluctuations in clove bud is influenced by:

(a) Weather patterns;

(b) Cycles of crop performance;

(c) Fluctuation in Exchange rates;

(d) Cleanliness and quality of the product;

(e) New Developments which favour natural ingredients as against synthetic materials;

(f) Development in Eastern Europe, China and other countries;

(g) Expansion into new uses and new markets;

(h) Developments in the Indonesian clove industry.

1.22 Clove leaf oil is characterised as a low price between 1976-1979, fell back in 1980 and recovered in 1981 and continued to rise there after. In 1984 , they stabilized at around £ 3.10 per Kg. CIF UK. Indonesian leaf oil (80% eugenol) rose to £ 3.12 per Kg. CIF UK and Madagascar oil (82% eugenol) stood at the same price. In July 1989 prices stood at £ 1.95 - CIF per Kg. UK for Madagascar and £ 1.60 - £ 1.50 CIF per Kg. for Indonesian leaf oil. Madagascar leaf oil normally commands a small premium over the Indonesian oil as its mimumum eugenol content is 82% compared to 80% in the Indonesian oil. As a general rule, the higher the eugenol content, the better is the price obtainable.

1.23 The future of the clove leaf oil market would depend on:

(a) Development of eugenol, iso eugenol and terpenes production facility in Indonesia;

(b) The success of the Singaporian eugnol processing plant;

(c) Competition from other eugenol rich oils like cinnamon leaf oil;

(d) The demand-usage pattern of clove stem oil with high eugenol content;

(e) Production of Synthetic eugenol from guaicol.

1.24 Clove bud oil prices rose sharply between 1975-1978 but the price rise moderated thereafter, reflecting increasing prices of cloves over this period. In 1983-1984 the prices remained steady at £ 23.00 per Kg. CIF UK in July 1989 in New York clove bud oil $ 24.00 per C+F N.Y.(U.S.A.) as against $ 2.40 per Kg. for Indonesian leaf oil and $ 16.00 per Kg. C+F N.Y.(U.S.A.) for Madagascar clove leaf oil. Zanzibarian clove bud oils sold around $ 8.50 Kg. in 1988/89 and $ 8.50 - 9.50 per Kg. in 1989/90 in the U.K. France and Switzerland.

The future clove bud oil would depend on:

(a) Competitiveness of clove stem oils to replace bud oil in many applications;

(b) Prices of oils of blends of bud and stem oil.

(c) Quality and purity of bud oil.

(d) Regularity of availability.

1.25 Clove stem oil price series not available. In 1983 clove stem oil of Malagasy fetched £ 10 (Fr. Frances 120) per Kg CIF French Ports. In 1985-86 prices ranged between in 1987-88 it was around $ 6.50-$ 7.00 per Kg US $ 6.30 - $ 7.70 London in 1988-89 prices ranged in London at US $ 6.50 - $ 8.65; in 1989/90 between US $ 5.00 $ 6.50 per Kg for London.

1.26 The future of clove stem oil would depend on:

(a) Reliability of supplies from Zanzibar and Madagascar;

(b) Quality and aroma of the oil;

(c) The development of new markets through dynamic sales and marketing strategies.

1.27 Price series are not available for clove oleoresins. In international Trade in olearesins no standard oleoresins are trade. They vary between manufacturers. They vary with the manufacturers specifications. Hence, the difficulty of giving comparative prices. Roughly, it is estimated that 20 Kgs. of ground spices equals 1 Kg. of oleoresins.

1.28 Most clove leaf oil producers like Indonesia, Malagasy, Brazil is going in for the manufacture of clove eugenol, clove terpines. This is used as a low cost substitute for clove stem oil in low grade fragrance and flavour applications.

1.29 Prices of eugenol and ISO Eugenol prices fell consistantly between 1977-1980 and reached a low point in 1980, of about £ 4.20 per FOB New York for eugenol and £ 1.80 per Kg. FOB New York for ISO eugenol. By 1984-150- eugenol prices went up to £ 8.50 per Kg. and in July 1989 ISO eugenol was quoted in the New York market at US $ 4.25 and 4.50 and eugenol 99/100 at US $ 6.95 per Kg. New York U.S.A. U.K. sources quoted prices for eugenol at about £ 5.00 per Kg. spot and for Iso-eugenol at £ 6.50 per Kg. spot (July 1984).

1.30 The future for clove oleoresins and derivatives depends on:

(a) Demand for such products in the USA and EEC

(b) Supplies from Indonesia, Singapore and France.

(c) Investments in oleoresin plants based on market demand.

(d) Price-volume ratio in relation to capital investments.

1.31 The prospects for clove spice revolves around the trends in Indonesia. Increased plantings have led to an expanded production base, but defoliation, sudden death, juvenile decline, die back, senality of trees,weather patterns. Clove production cycle would influence supplies. Simultaneously the increase in 'Kretek' cigratte consumption has made the medium term for clove spices reasonable favourable. The injection of aid and investment into the liberalized Eastern Europe countries the USSR, the PRC, Mongolia is bound to increase the use of the product and derivatives of clove like stem and bud oils. Increased living standards are going to create demands for flavours, perfermery and other convenient foods. The findings of therapeutic value of clove oils in cerebroncutropica, stomachia, antihelminthica, analgetica in medicine is bound to open new ground. The short term demand for flavours and fragrances is expected to increase in real terms by 2.3 %.Highest growth in the flavour areas are expected in sweets, ice cream, desert products , frozen foods, carbonated drinks. There is a demand from them for natural flavours as against synthetic

flavours. In the fragrances the main areas of growth would be toiletry where 5-6%growth is envisaged, whereas in the cosmeties and household sectors a growth rate of only 2-3%is expected. These factors are going to have their influence on cloves and clove derivatives. In the long run if Indonesia suceeds in becoming self sufficient in cloves, competition is bound to increase. Hence, consolidation of existing holdings by way of replanting senile trees, replacing deceased trees, and optimizing yields through better crop husbandry techniques and crop hygiene would be a conducive strategy. Clove stem oil from Zanzibar should be targetted for getting a fair share of the clove market . A target of 50-60 tonnes is not difficult to be sold despite the pessimission reflected in some reports from overseas experts, who have visited Zanzibar. By June 1990, it has sold 40 tonnes. It should plan its export strategy in such a way that it attains the target. This will require a stock of 1000 tonnes of clove stems which ZSTC could easily manage from its existing stock of 1200 tonnes in the hands of farmers and 500 tonnes expected in January to February 1991 would meet the raw material requirements to meet export targets.

Since simultaneously diversification of the product mix in cloves by production of eugenol, terpene, iso-eugenol. etc. could be explored long run with market demand and in consultations with the trade. Steps will also have to be taken to diversify into other lucrative crops based on agromomy,research, markets and the capacity of the

agricultural extension services.

1.32 The total land area in Unguja is 153,338 Ha. of which 17% of the land area is under cloves and in Pemba 91,830 Ha. of which 40% of the land are is under cloves. Only 0.5% in Unguja is under clove monoculture and Pemba 76% is under clove monoculture. The reason for the difference arises from the fact that much higher proportion of trees in the older age group are in Pemba where under conditions of higher rainfall and fertility, too dense a shade for intercropping is created, making only certain crops like tumeric,cardamom, pepper.possible intercrops.The very hilly nature of some of the best clove areas in Pemba with problems of soil erosion in valleys renders them less suitable for production of food intercrops like cassava and sweet potatoes.

1.33 Table I illustrates the very limited area of a cloves in Unguja. It also provides an indication, necessarily oversimplified of the kaleidoscope nature of the cropping system in Unguja island compared to Pemba and they provide bulk of Zanzibarian current output of 3000-12,000 tonnes of cloves per annum.

The Kilimo Census of 1987 provides an invaluable data base against which future development of the clove undustry in Zanzibar can be evaluated. The Census revealed that there are about 0.5 million .

trees on Unguja mainly in the central, Western and North B districts, a large portion of which (37.3%) below 10 years of age. On Pemba of the 2.3 million trees, most of which are in Mkoani and Wete districts, only 5.4% is less that 10 years old. In terms of the number of trees, data confirms that 82% of the trees are in Pemba, with a small number of trees in the age group 0-10 years. However, there are a large number of trees of the age category 25.50 years (see. Table II)

Table I :

The Area of Land (in Ha) in the Laned Use Categaries Associated with Clove Tree Cultivation in Unguja and Pemba

Land Use Categaries	Unguja	Pemba
Cloves	129	28041
Cloves + Settlements + Coconuts	-	23
Cloves + Settlements + Bananas	-	12
Cloves + Settlements	-	2
Cloves + Coconuts	147	5746
Cloves + Fruit Trees	-	104
Cloves + Coconuts + Bananas	24	651
Cloves + Coconuts + Fruit Trees	68	1281
Cloves + Coconuts + Bananas + Cardamoms	20	-
Cloves + Coconuts + Bananas + Fruit Trees	25265	531
Cloves + Cultivated land + Coconuts	114	63
Cloves + Cultivated lands	867	206
Cloves + Coconuts + Bananas + cultivated Lands	59	-
Cloves + Bananas	2	-
Total Area	26695	36736

Source: Zanzibar Clove Cultivation Manual
Peter J. Martin, Zanzibar Clove Research Project n.d.

Table II: The Age Class and the Geographical Distribution of Clove Trees in Unguja and Pemba

District	Age Class Years 0-10	10-24	25-50	50	Total	% of the Grand Total
In Unguja Islands						
North A	10986	4286	24163	4687	44122	0.1548
North B	57083	11198	42354	8643	99278	3.4775
Central	110645	16243	119585	9853	256326	8.9786
South	5197	110	3521	344	9172	0.3212
West	27228	8299	57735	10643	103905	3.6395
Sub Total	191139	40136	247358	34170	512803	17.9625
% of Unguja Total	37.3	7.8	48.2	6.7	100.0	-
In Pemba Islands						
Micheweni	10051	11858	217643	315241	315241	11.0422
Wete	40353	24018	426038	149253	639662	22.4061
Chake Chake	8958	21191	351443	44320	425912	14.9188
Mkoani	66390	149205	736852	8785	961232	33.6701
Sub Total	125752	206272	1732976	278047	2342047	82.0374
% of Pemba Total	5.4	8.8	73.9	11.9	100.0	-
Grand Total	316891	246408	1979334	312217	2854850	100.0

Source: CENSUS OF CLOVE TREES - 1987
MINISTRY OF AGRICULTURE , ZANZIBAR

1.34 It is evident from Table II that a high proportion of trees are over 25 years of age and is in marked contrast with the small proportion of trees in the 0-10 years age group.

1.35 Currently GOZ nursuries distributes a total of approximately 35,000 seedlings annually, even if it is increased to 40,000(33,000 in Pemba and 7000 in Unguja) with an accompanying improvement in the rate, the total production of cloves will continue to decline over the next 20-30 years until it stabilizes at around 3500-4000 tonnes per year. The reasons for these are as follows:-

(1) The mortality rate of seedlings in the year 1 after transplanting is averaged 50% because of the seedlings of variable quality, lack of good planting site preparation, poor planting techniques, lack of weed control , damage inf'icted during weeding, inadequate shade, effect of drought, juvenile decline, competition from excess weed growth and intercropping especially cassava and sweet potatoes.

(2) Outbreak of sudden death disease contines to make inroads into the stands of more mature trees and Unguja bears the brunt of the losses, which will continue in the future.

(3) Carelessness is still rampant among clove pickers, increased branch breaking at harvest time the

frequency of acute die back (Cryphonectria cubensis) will exacerbate.

(4) Cutting down of clove trees for charcoal making and roof timber for housebuilding.

(5) Fragmentation of clove plantations of the pre-revolutionary period into much smaller lots of acres after the land reform following the Revolution of 1964. The recipients of the 3 Acre lots has had no previous experience with the management of clove trees. The "new farmers" tend to treat clove crop as a windfall gain and invest little labour and virtually no capital in their maintenance. To them the clove tree in a sense an alien crop. The small holder think of the food crops first especially in Unguja and still feels at home with cassava, sweet potatoes than clove crop which is uncertain and gives low returns to his effort. His income is low even at farm gate level. Another reason for the neglect is most of them feel it is against the Moslem ethics to extract from someone elses confiscated properties to which they have no clear title nor has been registered in their name. To these lands the Moslem law of inheritence does not apply and therefore controversies are evident over succession. The political party branch level chief has a greater influence on land and he has developed hidden tenancy in the land over which he has his sway and the so called "new farmers' become

his tenants or a land borrower.

(6) A significant number of clove farmers do not actually farm the land upon which the trees are planted due to the historical factors as well as new conditions arising from the land reform. The result is many tree owners permitting "land borrowers" to cultivate the area and around their clove trees. Thus, it is easy to be absentee landowners. There is a lack of household labour and they feel that it is not necessary to cultivate all their land for household food requirements. This is considered to be an arrangement of mutual interest since the tree owners has someone weeding the areas under his trees whereas the land borrower (who is often a Mainlander without land right) has access to land to get his household consumption needs. It is a practice that is considered to have value by evening out some of the rigidities of land allocation and unequal distribution. This was revealed in the GTZ Survey of 1988 (Technische Universitat Berlin 1988:21) where the land tenure of cultivated where the land tenure of cultivated household land was:

34% borrowed

16% inherited

18% family polt, usually inherited with proceeds of tree crops divided between family members

14% distributed by government during the land reform

6% purchased

6% seasonally allocated by government for rice production

9% other.

The "land borrowers" with insecure short term - usufruct right to land are not concerned with the soil and long term soil fertility. There is extensive planting of cassava, a crop which is easy to plant and high yielding, tends to undermine soil fertility and careless cultivation ultimately damages the clove tree roots and adversely affect the growth and the production of cloves.

(7) The practise of crop leasing. Many farmers with insufficient labour or capital for harvesting markets the crop through "crop leasing" which contributes to the widespread haphazard methods of harvesting cloves which accelerates die back in clove trees. Another factor that has triggered "land borrowings" and "crop leasing" is the general belief that certain forms of cultivation involving digging are demeaning and best be done by the Mainlanders notably the Wanyamwezi, who are considered to be temporary target workers, who will return to the Mainland.

(8) The clove tree ownership and the active pursuit of cash cropping which are particularly divorced from one another in the case of clove. Cloves are seasonal. Production is uncertain and variable year to year.

It is heavy on household labour availability. For the farmers the effort in terms of labour and capital required to hire labour is not commensurate with the returns from cloves. Clove earnings can be significant vis-a-vis the annual household earnings but are often spent quite rapidly in a "feast or famine" frame of mind, leaving the household feeling more improvished than before. Therefore, cash cropping with cloves has become a marginal activity for rural households of all income brackets. A survey conducted by GTZ in 1988 revealed that the crop sales constituted between 17 - 19 % of the total household income brackets. The same survey revealed that when farmers extended their crop production, food crop notably those for subsistence, rather than for traditional export crop like clove tended to be planted. The farmers motivation was primarily cash. Thus, this trend reveals

(a) at present household land and labour expenditure are weighted towards subsistence rather than cash earnings.

(b) There is a conscious strategy to diversify sources of income thereby reducing risk.

Thus, in order to maintain clove production even at present levels, and feed raw materials to the Pemba, Chake Chake distillery it it necessary to adopt a strategy to consolidate existing acreage, upgrading

yields through:-

(A) Addressing on the problems associated with the lack of security of land tenure, which the Mission understand the GOZ is addressing itself currently, through the Zanzibar Commission for Lands and Environment.

(B) Rehabitation of clove areas through systematic replanting, new planting, underplanting in suitable soils and maximize yields in such areas.

(C) Diversification of the income of clove tree owners through crop diversification of existing lands with the following crop combinations with maximization of income of farmers, optimising land use and increasing raw material supplies to maximize the capacity utilization of the clove distillery at Chake Chake, Pemba.

-Clove + Pepper + Ginger

-Clove + Pepper + Cardamoms

-Clove + Pepper + Lemon Grass

-Clove + Pepper + Vetiver

-Clove + Pepper + Citronella

-Clove + Cinnamon + Pepper

-Clove + Pepper + Birds Eys "Kichaa" chillies for export

-Clove + Pepper + Tumeric

(D) Revising clove prices, so that even people who do not harvest the crop would collect the crop.

(E) Necessary regulation may have to be initiated to permit those formers who look after crop productivity to keep much land and those who neglect land to be taken back.

(F) Steps to register landownership to overcome the sense of uncertainity of ownership may be looked into by GOZ.

(G) Registration of all clove growers and issue of Farmer Cards to them in order to ascertain size of holding the crop and estimated supplies.

(H) Develop linkages with UNIDO project ODA, FINDA and other donor projects in this field. Another area that needs attention is the input and the credit package for clove industry which will be discussed under internal marketing of cloves and essential oil crops. Crop diversification is yet another strategy that could be pursued in this regard.

CHILLIES

1.36: The "Kichaa" variety of chillies has been identified as a potential export crop and market intelligence has indicated that the trade accepts the quality and the price. "This crop was grown in Zanzibar in large quantities during the last century.

Production was also very large in the early years of the present century and during the year 1905, 205 tonnes were exported. Exports have dropped to 17 tonned in 1923 and to 4 tonnes in 1946" (A.K. Briant (1989). Since he wrote it export of "Kichaa"

variety of chillies rose to 72 tonnes is 1957; 2 tonnes in 1987 and is now projected to be 5 tonnes in 1990.

1.37: Since 1983, thirteen nursuries have been established in Unguja and 5 in Pemba but the uptake of free seedlings has been patchy. ZSTC is the sole purchaser and exporter. Exports are around 10 tonnes at present. Although , ZSTC is the sole buying agent significant quantities are sold to the Tanzania Mainland. Malawi is the largest supplier of this type of chillies to the world market. Tanzania has apparently its own programme.

For birds eye chillie production like Kenya and Malawi. There is a steady demand for Zanzibarian "Kichaa" chillies and is planning an export target of 200 tonnes with emphasis on quality than quantity. The ODA Farming System PRoject backs the crops as an alternative diversification crop. With an average yield of 750 kg per Hectare, in order to attain a target of 200 tonnes, it is planned to bring 265 Ha(640 Acres) under cultivation in 1990-1995 period. As a diversification crop it meets with all criterion based on markets, adaptability and acceptability by farmers, price based on returns to farmers, tradition etc. ZSTC offers the market outlets to the crop. If surpluses are available in the future and the UNIDO project envisages to go into oleoresin production,

then this crop could be an ideal raw material for chillie olearesin through a solvent extraction pocess. Until such time , it is best for ZSTC to concerntrate its efforts to exports of sundried or kiln dried "Kichaa" chillies. EEC especially the U.K. and Japan would offer a market for the produce.

1.38: CLOVE OIL DISTILLATION

Zanzibar operated a clove stems distillery at Malindi, Unguja, which was originally owned and operated by the Clove Growers Association Its exports were around 178.5 tonnes annually between 1941-1948(Vide:R.O. Williams - GM, Clove Growers Association., Tanzania 1949). It continued exports till 1967 when it ceased operations. In 1983 a modern stemoil distillery was created and began operations, it was standarised by a French firm, Tournair Fere, Grasse, France who supplied the equipment. This was followed by the production of clove stem oil and 1989/90 it started distillation of clove bud oil.The distillery comprised of ten distillation

units of 3000 litre capacity capable of taking a charge of 700 kgs of clove stems. The 10 stills could take a charge of 1 ton of clove stems. The units have been built in arrangement for distillation of clove stems at 100°c - 120°c still temperature, corresponding to still pressure at 1.5 - 1.8 bars in the still. At present out of the 10 stills, one still is set aside for distilling lemon grass oil and one another needs minor repairs, leaving only 8 stills for commercial operations. The time taken for one charge of clove stem is 5 hours and for clove bud is roughly 30 hours. Under normal conditions 4 clove stem charges are possible. The lemon grass still can take 2 charges for a day working 2.3 hours per charge. The distillery, under normal conditions runs on one shift processer 5600 kgs of clove stems in 8 stills yielding 220-250 kgs of clove stems oil per day. Although, at times, a yield of 5.5 is expected since 1983 except for few years average yields have been between 4.05%- 4.5%as shown in Table III below.

Table III : Yields of Clove Oils distilled: 1984-1990.

Year	Quantity of stem distilled (Kgs)	Oil distilled (Kgs)	Yield
1984	420,612	22502.7	5.349
1985	260,400	13175.7	5.02
1986	195,300	8965.8	4.59
1987	554,525	24965.7	4.502
1988	362,800	17320.4	4.77
1989	619,500	25110.9	4.05
1990 (Jan-March)	574,700	23852.1	4.15

Source: Chake Chake oil Distillery Pemba

1.39: On the other hand, the distillery began clove bud distillation from 1989 and its production and yield is as follows :-

Year	Quantity of Buds Distilled (Kgs.)	Oil Distilled (Kgs.)	Yield
1989	14301	1990.3	13.72
1990(Jan-March)	36805	5107.5	13.87

Source: Clove oil distillery: Chake Chake Pemba.

1.40: Although an average of 15% can be attained yields have been averaging at around 13% with grade IV mpeta clove buds. The low yields in both stems and buds are ascribed to low distillation efficiency due to leakages in the valves and damages in the cooling towers which affect the cooling system that makes it difficult to control temperature which in turn effect some constituent of the oil.

1.41: The distillery normally operates for five days a week, Friday is kept for general cleaning and the maintenance of equipment and the boiler. Under the current working schedule it is possible to distill 1300 tonnes of clove stems on one shift basis yielding 50-60 tonnes of oil per annum. Distillation of clove stems done for 5 hours is reported to produce non-contaminated vaccum distilled 99.9% dry oil with 93-95% eugenol content (Minimum 89% Average 83%). The oil obtained is of light yellow colour

free from moisture and suspended particles.

Operations of the units is not difficult but needs much more effective control and supervision. The distillation manager is effective but is flooded with day to day operational problems including attendance to and supervision of the nucleus farm at Magome. Although there are other potential personnel at the Distillery who could take responsibility they are untrained and fight shy of responsibility.

1.42: Oil from the seperators is removed at regular intervals, weighed, put into containers having fine mesh for removing any dust or suspended materials. The filtered oil is pumped into a vaccum distillation unit where from water/moisture is removed from vaccum. Clean and transparent oil is packed in drums for export via Zanzibar and Dar es Salaam international port.

1.43: An analysis of the operations of the distillery reveals one of under utilization of its installed capacity . A large investment has been made by the GOZ and its parastatal . ZSTC in establishing the modern steam distillation plant at Chake Chake, Pemba. This unit is solely meant for clove stem oil distillation. Since no clove oil is used in domestic industries the oil is destined exclusively for export. The production capacity of the unit, if worked on a two shift basis, is 110-120 tonnes of oil from 2800 tonnes of clove stems. Regular availability

of clove stems is around 2000 tonnes annually. No clove stems and Grade IV clove buds have been perchased by the distillery since May, 1989. The godowns of the distillery has 1200 tonnes of clove stems and 44.2 tonnes of mpeta clove buds. The people have with them about 500 tonnes of clove stems from the last crop and another 500 tonnes are expected to be collected in 1990/91 crop year. The under utilization of the capacity of the distillery on the basis of 80 tonnes per shift is given in table IV.

Table IV: Capacity utilization of the clove oil distillery at Chake & Pemba.

Year	Stem oil produced	Average yield	Bud oil produced (Tonnes)	Yield	Capacity Utilization
1983	24.5	5.15	-	-	30.6
1984	22.5	5.35	-	-	28.125
1985	13.17	5.05	-	-	16.46
1986	8.96	4.59	-	-	11.20
1987	24.96	4.50	-	-	31.20
1988	17.32	4.77	-	-	21.65
1989	25.11.	4.05	1.9	13.92	31.39
1990	23.85	4.15	5.1	13.88	29.89

(Jan-March)

Source: Clove oil Distillery - Pemba.

1.44: On the above basis, the average capacity utilization (1983-1990) was only 29.198 leaving 70.802 as idle capacity available for utilization.

1.45: During the mission, the distillery has not been in operation due to several controllable and exogenous problems that need immediate attention in the face of increasing orders that are placed for clove oils from abroad due to its high quality. They are briefly as follows:-

(a) Irregular electricity supplies:

The normal source of electricity supply is from the thermal plant at Wesha at Pemba. It regularly break down due to operational problems due to heave loading and lack of spares. The distillery has three generators as standly source of electricity 105 KVA (Rolls Royce), 90 KVA (DAF) and 33 KVA (Ford). Only the rolls Royce generator was working during the Mission and the Ford needed repairs. The cost of electricity component in the production cost was high. 1988/89 electricity cost was 4.19% of the cost of distillation and in 1989/90 it averaged around 4%. In order to make the clove oils less costly and be competitive, it is necessary to solve the problem of electricity , because in the long run, with possible increasing export orders and diversification, the demand for electricity would increase.

(b) Water Supply to the Distillery:

The distillery faced the problem of irregular supplies of water from the town. The UNIDO project has funded the digging of a bore hole including the provision

of a motor and a pump. If the distillery is to operate commercially and take up various diversified crops its is worthwhile to ascertain the continuous supply situation to meet any new demands.

(c) Leakages of steel drainage valves in the still:

Leakages in the steel drainage valves of the still is resulting in a loss of oil yield of 1% which is a loss of revenue to the distillery. Even the needy replaced valves are not working properly.

(d) Defective cooling tower:

The damaged cooling tower is not working properly and therefore the distilled oil could get affected especially in clove bud oil, if the temperature cannot be controlled. This will have to be resolved if the capacity of the distillery is going to be utilized to the maximum.

(e) High stocks of raw materials:

The lack of perspective planning of stock in terms of market demand, stock controls, the regular closure of the distillery due to regular breakdowns, results in large stocks of raw materials lying idle in distillery godown. This tying of funds, which does not generate interest or income to ZSTC, is a great burden on the organisation. Since the distillery is mainly a clove stem oil distillation plant, it should carry a mimimum buffer stock of at least

500-1000 tonnes per annum. The bud oil is an ancillary product and where low quality buds are available, they are distilled.

(f) Policy of stems purchases:

In the recent past, clove stems fetched a low price of T shs. 1.75 per kg and farmers were not used to the collection of clove stems. This affected the clove distillation at the initial stages. Since 1986 prices of clove stems was increased to Tshs. 4 for grade 1 and Tshs. 3 for grade 11 , and thus, since 1987 clove stem supply increased.

The distillery has not been purchasing stems since May, 1989. This has resulted in producers having roughly 500-600 tonnes of stem for from 1989/90 crop. As time passes the yield of oil from stem tend to reduce and farmers get frustrated wi th stocks at hand. The low incomes of farmers in the face of rising inflation weakens the purchasing power of the farmers,resulting in farmers being not interested in stems. There is a case to increase prices of stem based an break even cost vis-a-vis the fresh stems because buyers have preferences to distilled stem oil from fresh stems. The other alternative is for the distillery to purchase all exisiting stocks with farmers at the going price and distill derivates of cloves like eugenol, iso-eugenol vanillin and turpenes for export. This will earn the country

exchange , diversify the product mix within clove products and satisfy the producers.

1.46 Apart from these production problems affecting supplies, quality and therefore the marketing there are few issues at the distillery that needs the attention of the ZSTC/UNIDO.

(a) Lack of Transport:

The distillery has only one 7 tonne Tata lorry for purchases, transport of finished products and the personnel. The lorry is defective most of the time and they have either to hire or borrow vehicles from others. The distillery Manager has to walk to the plantation to supervise work. The small Renault lorries which are five years old kept in the garage due to lack of necessary parts. The 7 year old Peugot pick up is immobile. There is only one forklift for internal transport of raw materials and finished drums of oil.

The UNIDO project has already despatched a jeep which would resolve the problems partly. For stem purchases and transport of finished products to the godowns, it is necessary to provide a reliable truck which can withstand the terrain and the work load. It is always necessary to purchase a make which has after sale facilities and spares. There is also a need to have a stock of spare parts and a person with mechanical oriatation to be trained in motor mechanism and vehicle maintenance; similarly, GTZ project could be persuaded to donate a micro bus it would certainly be of use to the distillery and for the mobility of the staff as well.

(b) Most of the staff in the Distillery (except the Plant Manager) are not trained or exposed to similar technological environments. The Distillery Manageris dynamic and competent, has the necessary background to assimilate knowhow. The UNIDO has already ensured the training and exposure of the Plant Manager in Poland, France, U.K. and India. It would be useful if he is exposed to lemon grass and cinnamon distillation in Sri Lanka. After his training ZSTC should ensure his career prospects and ensure that he serves the distillery, train his counterparts for a mandatory period of time, without moving him elsewhere, as it has been the case in the past.

The Production Manager/Chief Engineer having an

engineering background is eager to learn and has the capacity to learn through practical training and exposure. The UNIDO projects envisages to train him in India and possibly in selected countries along with the Distillery Foreman.It is suggested that there training caters other oil distillation other than cloves in countries like Sri Lanka and possibly France. Similarly the maintenance Foreman is expected to be trained in Pakistan under the UNIDO project. It may be worthwhile extending it to cover at least one Indian distillery say at Bombay. The distillery lacks qualified chemists for analytical work and ZSTC must recruit a young qualified analytical chemist. He could be trained in France and India by UNIDO project. The distillery also requires a qualified trained manufacturing accountant who could ensure cost analysis, variance analysis, pricing, cost controls, introduce systems for the smooth flow of materials and finished goods. The current incumbent has the potential for such a training in a Distillation firm in India.

(c) Low Productivity of Workers at the Distillary:

The distillery carries a permanent cadre of 76 workers whose productivity is low due to regular breakdown of the distillery, lack of understanding of the importance of the work programme, lack of motivation arising from low pay and lack of amenities.

(d) Lack of basic facilities for Management Information flow and Production planning and progress monitoring.

The Distillery has a weath of data which cannot be readily processed and used. The only communication link with the outside world is the telephone which is often dead. The marketing Division of the ZSTC Telex is not working regularly and even during the Mission, it was not working for nearly a month and buyers have been unable to contact the ZSTC. The division has no regular dialogue with the Distillery except at the iniative of the Distillery Management. The Distillery has no linkages with outside organizations.

(e) Lack of an full Time Agronomist to Overlook the Experimental Farm at the Magome, Chake Chake.

In spite of the recommendation of the CTA and the Agronomist under UNIDO project, the farm at Magome, still has no full time qualified agronomist, to propagate lemon grass, vetiver, cinnamon and cardamoms. The Distillery Manager has to overlook the farms operation with the help of a casual supervisor.

1.47 Therefore, it is recommended that, since these factors, influences production and thereby the marketing availability and capability of finished products the following steps be considered, whilst steps are been

taken to diversify the operation at the distillery at Chake Chake.

(a) Attend to the problem of electricity supply by ZSTC taking this matter up with the highest level-in the GOZ. The generators have limitations in rated capacities and frequent uses may result in breakdowns regularly.

(b) Assess the requirement of water with the proposed diversification, in view and bore additional holes, and establish a water treatment plant where necessary.

(c) Take steps to replace leaking drainage valves, damaged cooling tower, have adequate spare parts including necessary bricks for replacement of the furnance when repair become necessary.

(d) ZSTC to ensure that 5% of the foreign exchange earned from clove and other future essential oils be allocated for any demands for spares worker in action and R + D work.

(e) ZSTC to ensure that the Distillery maintain a minimum buffer stock of good quality stems, especially Grade I. The minimum buffer stock should be 1000 tonnes.

(f) ZSTC clove stem distillery to explore the possibility of utilizing low quality stems for the production of Eugenol, iso-enogenol, vanillin and terpines as a part of the diversification programme.

(g) ZSTC in consultation with UNIDO , CTA, take steps to purchase and instal a cohabation plant at the Distillery.

(h) Price revision of Grade 1 stems upwards and keeping a wide margin in prices between grades. The justification for this can be argued from two angles.

(i) The total cost including the cost of

stem used @ Tshs. 4 per Kg. = Tshs. 17,758,068

Total oil produced (1989/90) = 25,243.8 Kgs.

Break even cost = Tshs. 17,758,068

25,243.8

Tshs. 703.4

At an exchange rate of 193 Tshs.=1 US $ = US $ 3.64/Kg

The current price of clove stem oil

from Zanzibar = US $ 5.00-6.00/Kg

= Tshs.1000-1300/Kg.

Gross profilability = 1900-703.4=296.6/Kg

= 1300-703.4=596.6/Kg

If the price of Grade 1 is increased to T shs. 8/Kg.

the break even cost = T shs. 710.93

= US $ 3.68

Therefore, a price revision upwards of the purchase price of stems is recommended.

From the angle of agricultural this increase could be justified, taking into consideration the average price of clove buds now fetching abroad, devalued value of Tshs. cost of living, cost of production and marketing, ZSTC overheads for collection.

If the international prices are taken at US$ 1000-2000/ tonne (mean US$ 1800) devalued Tshs at 195 Tshs to a US dollar Devaluation at 35%.

Cost of living at around Ts.shs 500-800 per individual per day.

Cost of production per acre of cloves at present minimum wage rates at Ts.shs. 3515.30 per year.

50:50 ZSTC cost of marketing + cost of production of the producer then to produce 162 Kg per acre.

Total cost = Tshs. 17255.30 cts.

Mats for drying = @ 50 shs per mats

1500 T shs drying cost = Tshs. 3000

Picking cost = 308 pitches at 30 Tshs. per pitchi= Tshs. 9240

ie. 162 kg dried cloves from 588.8 kgs. of green cloves from 308 pitchies.

If we assure that the yields of buds are

Grade 1 -	25	of the crop	40.5
11	50	" " "	81 Kgs
111	10	" " "	16.2 Kgs
IV	15	" " "	24.3 Kgs

The cloves would yield 20% - 25% stems = 32.4-40.5 kg stems. ZSTC cost = Tshs. 250,345.20 for 1 Ton of clove = T shs. 250.345 for 1 kg. At present Grade 1 Buds = 100 shs

11 " = 85 shs

111 " = 65 shs

IV " = 35 shs

Grade 1 stem = 5 shs

11 " = 3 shs

Therefore, the case for increase of buds to 150-170 shs for grade 1 grade IV to GS shs. and stem to grade 1 - Tshs. 8 Grade 11 4 Tshs would be justified.

This will at present BEC of clove stem oil will not be affacted.

* Provision of additional two , 7 tonne trucks and a passanger van through C[illegible] or EEC funding.
* Training of mechanically oriented worker in minor repair and vehicle maintanance.
* Training to be given to production Manager/Chief Engineer Distillery foreman, maintenance foreman, accountant and ensure they are kept in the distillery for a mandatory period and they in turn train worker and motivate them through regular awareness programme on the job.
* Appointment of young qualified analytical chemist and a full time agronomist should be given a training abroad.
* Preparation of an annual production programme and fitting it with the annual marketing plan and

ensuring adherence through progress review by the GM of the ZSTC.

* Bringing the distillery under the direct management of the GM-ZSTC with distillery Manager reporting to him directly.

* Provision of the following facilities to Chake Chake Pemba Distillery.

i) Micro-computer for data storage/analysis

ii) Fax machine linked to Zanzibar State Trading Corporation marketing Division

iii) Provision of drawing boards and related accelaries for the engineering department.

iv) Provision of a additional forklift to the distillery.

v) Establishment of a technical book reference library at the Distillery with necessary books and journals.

Unless these basic things are attended to it will definitely have its impact on production and supply of products for marketing.

1.48: BLACK PEPPER

Small quantities of black pepper from the pepper vine, Piper nigrum, belonging to the family Piperaceae is grown both in Unguja and Pemba islands, both as a small holder mixed/mono crop and in the government farm at Kizimbani. Much work has been done at Kizimbani in the past including breeding but the follow up action has been lacking. This was observed by the Mission during

his visit to Kizimbani where excellent plots have been left to neglect.It was observed by the Mission that it is now usual to find 10-25 vines in the most fertile ground near the homestead with the initial support being provided by old clove trees. In Kizimbani Experimental station Gliricidia sepium, as in Sri Lanka, provides both support and the required top shade.

1.49: The dried pepper fetches 2000 Tsh per kg(US$ 10.30) in Zanzibar town (June 1990) and around 800 Tsh per kg in Pemba. It has a ready market in the Mainland Tanzania and Kenya. No data was available on yields but a farmer, the expert met in Pemba, reported that a yield of 1 kg of dried pepper was obtained per vine. Agro-climatically Pemba is the most suitable for propagating pepper on a large scale both as a intercrop in clove as well as a mixed/mono crop in homesteads.

1.50: The crop in very important to be encouraged from the point of view of crop diversification, multi cropping in cloves, as a new spice for both local and export market, and a source of raw material for the Chake Chake , Pemba, distillery to distill pepper oil and subsequently with necessary facilities to undertake pepper oleoresins.

1.51: The UNIDO project in collaboration with kilimo should establish a reasonable acreage in the ZSTC farm in Pemba of various cultivars from India, Malaysia, Sri Lanka and Indonesia and experiment with various techniques of shades.

1.52: CINNAMON

Cinnamon has been grwon for many years in clove areas of Unguja and more in Pemba it has never been commercially developed. Small quantities of dried bark is marketed locally at Tsh 800-1900 per kg. This is used in Palau in Zanzibar. The price is Tsh 800 per kg pepper.

1.53: Cinnamon in both Unguja and Pemba are free from any serious pests and diseases. Its grows is vigorous and yields in 2 years. The potential is high in Pemba than in Unguja . It is a crop which can feed raw materials - leaf and bark to the distillery at Chake Chake . Thus, it is a crop that could be introduced to Pemba household agro system. Good mother plants are available at Kizimbani Experiment station.

1.54: TURMERIC

Market led production of turmeric assisted by the Department of Agriculture, Research and Extension began in 1969 and as a result there are several hundreds of producers in Unguja concentrated mainly on the red soils of the Mkwajuns district and on similar soils in the South at Makunduchi. Yields of sundried rhizomes averages 2500 kg per hectare with growers receving Tsh 170 per kg in Zanzibar and up to Tsh 300 for sales in Dares Salaam. No evidence are available of exports.

1.55: Only one variety of turmeric is grown and the requires partial shade. There is a need to introduce new cultivars for different soil and micro climatic conditions in both Unguja and Pemba. There is also a need to introduce pure and intercropping stands and solve the disease problem. This is a crop which has developed without any GOZ assistance. This is a crop very suitable for

propagation in Pemba.

1.56: CARDAMOM

Government of Zanzibar encouraged this spice in Pemba and Unguja in the late 1970's , using Malabar variety. It was introduced on privately owned clove holdings. Little or no follow up was done. The Kizimbani Experimential Station has cardamom under Nutmeg and Cloves doing well. Plots inspected in Unguja and Pemba does well and produces a good crop of capsules. Cardamom is sold in Zanzibar at 1000 Tsh per kilo and is also marketed on the Mainland.

1.57: Cardamom does well in clove areas, though it has not been a commercial success. It can be used both for export as a spice as well as used as a raw material for distillation at Pemba for cardamom oil.

1.58: NUTMEG AND MACE

The 'Ceylon ' type nutmeg is grown. The Kizimbani Experiment Station has nearly 300 nutmeg trees and few trees were also observed in Pemba. The nuts are small and would be ideal for distillation. A nut is sold for Tsh 5 per nut.

1.59: LEMON GRASS

This grass is grown by Zanzibarians for uses as 'tea' and they call it. It grows well in Pemba and the distillery is propagation it in their Experimental farm. The yield of graa s per Acre has been 1600 kg which yields

a 0.35% oil.

1.60: VETIVER GRASS

This grass is grown in Pemba both to arrest serious erosion and on an experimental basis in the experimental block of the Distillery. On 2.5 Acres wildly growing vetiver has been plantedon the ridges along the contour similar to the traditional type ridges used for the cultivation of cassava.

1.61: PATCHOULI (POGOSTEMON CABLIN)

This plant does well in Pemba and shows good promise even under non commercial cultivation. Leaf can be produced in six months after planting and plucking can be done two or three times a year.

1.62: LIME

This plant was developed in the 1950's and has been neglected now due to the wither tip disease. Lime oil and the lime juice has been distilled at the distillery at Malindi in Unguja. Lime oil has been exported but is now not exported because the distillery at Unguja has been stopped for rehabilitation.

1.63: GINGER

Fresh ginger called Thangavizi is grown in Unguja and Pemba in home gardens. The local price is Tsh 120 per kg. The scope for this crop in Pemba is much and would be as ideal raw material for the steam distillation for ginger oil at the Distillery at Pemba.

1.64: BITTER ORANGE

This crop does well in Pemba and if commercially cultivated would offer a suitable raw material for distillation at the Distillery.

1.65: YLANG YLANG

This plant thrives well in Unguja and Pemba islands. The plants can be seen at Kizimbani Experimental Station in Unguja. At the time of the mission the plants were flowering. Zanzibar used to export Ylang Ylang oil. There is 2 Acres planted with the crop in Unguja and planting material is available. The local flowers yielded 2.5% oil and has been reported by the trade as of ISO standard. In Zanzibar it takes about 2-3 years to bear.

1.66: OCIMUM

The following Ocimum plants have been found and the essential oils from them have given positive results.

Local Name	Botanical Name	Characteristics	Contents
Kivumbasi	Ocimum Kilimandscharicum	Camphor odour small herb.	Cineole-40-30% Camphor-25-93% B-carcphyllene-5-14% B-elemen/x copaene-3.27%
Mtulie	Ocimun Suave	B-Ocimene eugenolic and caryophyllenic odours	

Local Name	Botanical Name	Characteristics	Contents
Mrehani	Ocimum basilicum var-glabratum	needs irrigation methylcha icol	Chavicol(90.36%) linalool(3.02%)
Mipachori	not identified botanically suspected as artemesia sp.	blue oil	0.85% azulene 25.4 % camphor 9.14% 4-Terpenell 6.25% geranylacetate 5.16% carophyllene 3.65% linaool/ Thujone 2.67% engenol

1.67: With proper opinion from the trade especially direct perfumery manufacturers before expanding the acreage on a commercial footing is a must.Thus,it is seen that the various essential oils and spices discussed is known in Zanzibar but what is required by the kilimo is research backing, training and marketing.

2. PRESENT PRACTICES OF TRADE IN SPICES AND ESSENTIAL OILS IN ZANZIBAR

THE ZANZIBAR ECONOMIC RECOVERY PROGRAMME

2.1: In 1986 GOZ faced with a declining economy and major structural and financial problems, followed the example of mainland Tanzania and launched a Zanzibar Economy Recovery Programme with the approval of the Economic Committee of the Revolutionary Council, the planning council and the House of representatives. It contains a set of reforms designed to deal with the deteriorating economic situation..The programme was officially presented with the Development budget for financial year 1988-1989. The main objectives are to achieve. In the medium term:-

(a) at least a 4% annual growth rate of GDP.

(b) to reduce the rate of inflation

(c) to generate balance of payments surpluses that would eliminate external payment arrears.

In order to achieve its mission the following reforms were recommended:-

(a) To reduce the role of the public sector by curtailing public spending and limiting the economic involvement of parastatals;

(b) to improve pricing, tax, tarrif and subsidy policies;

(c) to increase real intrest rates;

(d) to improve the quality of public investment;

(e) to liberalize foreign trade ;

(f) to encourage the greater participation of the private sector.

The agriculture sub-sector reforms included:

(a) regular review and adjustments of the producer prices and their links with world market prices;

(b) removing subsidies on imports;

(c) phasing out parastatal operations;

The intention of GOZ is to full implement these measure during the 1988/1989-1990/1991 period. Certain changes have already been implemented and the guidelines on private investments have been issued.

MARKETS AND PRICES

2.2 Agricultural marketing in Zanzibar is shared the public and the private sectors.In contrast to the Tanzanian Mainland, in Zanzibar , no cooperatives are involved in agricultural marketing.Public intervation is mainly concentrated on the export of cloves, chillies, copra and the import of rice and farm in puts, the establishment of sales and marketing margins and to a limited extent, on providing guaranteed minimum support prices for selected domestic food crops. Producer prices for cloves have been maintained in the past at a very low level and large proportion of the price has traditionally been used by the GOZ as a means of raising revenues.

MARKETING OF ZANZIBAR CLOVES

2.3: ZSTC was established as a public sector enterprise in 1968 to undertake the functions of the clove Growers Association. Since its establishment, ZSTC has been involved in the purchasing and international export marketing of clove buds, clove oils, copra , chillies and lime oils. As was the case with the predecessor, the ZSTC continues to be involved in the importation and supply of gunny bags, scales, drying mats, hurricane lamps to clove srowers through its extension network of 56 buying centres(44 Pemba Island and 12 on Unguja Island) (see Map in Annexe). The ZSTC operated two distilleries, one delapidated still at Unguja (now closed) and another modern Franch built stainless distillery at Pemba in Chake Chake . The distilleries have a total production capacity of 170 tonnes. The distillery at Unguja produced lime juice for the domestic market and lime oil, clove oil for export. The Pemba Distillery with 110 ton capacity produces clove stem oil, clove bud oil and some lemon grass oil. The ZSTC is headed by General Manager who reports to a Board of Directors. He is assisted by two Deputy General Manager, One each for Pemba and Unguja operations. The total work force comprices 645 permanent staff 287 on Pemba 311 on Unguja 47 in Dar es Salaam . The ZSTC continues to be GOZ's key export agency and the major source of foreign exchange earnings and

central garnment revenue.The 1958-1960 period, brought the GOZ from the clove export tax (which was pegged at 20%) of the export value) earned between 25-33% of the GOZ recurrent revenues. Between 1981-1986, ZSTC paid 90% of its annual net profit as Government revenue. In 1987, 50% of its annual net profits (Tshs 88 million) went as Government tax revenue.

ZSTC continues to be a key agricultural marketing institution in Zanzibar. It has the monopoly on the marketing of cloves, clove oils which between 1976-1986 accounted for over 90% of total export earnings of Zanzibar. ZSTC also remains the only intermediary trader for copra which it purchases from private copra makers and sells to the small scale industries or Shirika Viwanda for soap and coconut oil production or exports. More importantly due to lack of agricultural credit package, ZSTC has commenced financing the nursery production and distribution of chillie seedlings in Zanzibar, as an athernative export , crop for the future.

INTERNAL MARKETING AND TRADE PRACTICES IN CLOVE PRODUCTS

2.4: The annual clove harvest in Zanzibar is composed of two crops, the Mwaka crop and the Vuli crop. The Mwaka crop is harvested from July - October and the Vuli crop from October-December/January. In some years both crops occur while in most cases one crop may predominate. The dominant crop may vary indifferent

parts of both islands. The of the Unguja and Pemba annual crop harvests has shown very large annual fluctuations throughout century. Typically a bumper harvest years are followed by poor harvest years and vice versa. Sometimes medium or low harvest occur in succession but two bumper harvests never occur consecutively. These annual fluctuations reflect a tendency for individual clove trees to yield heavy and light crops. This synchronisation affects trees : both Unguja and Pemba and explains why there is frequently a coincidence of bumper or poor harvest in the two islands. Individual clove tree yields are extremely variable. Even the same tree shows large annual fluctuations in yield because of the tendency of trees to biennial bearing. In the past clove trees yields have been correlated with the tree girth, tree canopy and tree girth correlated to canopy. As a general rule in Zanzibar ,within a given plantation and the yield potential of a tree will depend largely on the amount of canopy its possesses. It is believed that trees with large canopics yields more than the trees with small canopies. This explains why the yield vary between the old and young trees and between a healthy and diseased tree with poor canopies. The average yield per tree could vary between 20-80 pitchie. (1 pitchi. 4 lb) per tree. On an average it varies between 20-50 now. On the basis of 230-300 trees in an acre yields could vary from 4600-15000 pitchies of green clove buds, and 25%

that would yield stems. However, in all lands most trees are not yielding, due to factors already discussed. Before the harvesting season ZSTC announces the prices.

2.5 Since buds do not all reach the harvesting stage simultaneously they are harvested at intervals and the irregular maturation of the buds makes harvesting of large shambas difficult. Since labour is in short supply and cost of harvesting is high much crop remains on trees. Buds on tall trees cannot be reached. Picking buds at the correct time (ie. when the heads develop a pinkish colour) is important since early gathering result in cloves getting wrinkled and having less eugenol and if gathered late. The flowers turn deep red and blooms out. If the buds are plucked a day after the stoms appear the buds when dried loose corolla and male parts and yield cloves without heads. Another problem is five or six days after blooming the fecundated ovary grows in size, the calyx swells and cloves become worthless. Therefore, in Unguja andPemba, timely harvest is important and in most times total clove crop cannot be gathered all at once without loosing a considerable part of it. Thus, Kilimo and ZSTC field staff has to see that

(a) There is no premature collection of buds

(b) Careless in plucking the clusters at the base is minimized.

(c) Excessive breakage of leaves and twigs are prevented.

2.6: Harvesting is done by pickers who climb the trees, pulling high and high twigs together with the help of hooked stap to collect less accesible clusters. On tall trees harvest is incomplete since upper branches are too frail to permit pluckers to stand on them. The pickers frequently meet with accidents and deaths and it was reported that Pemba with high crop has less accidents compared to Unguja where crop is low but claims are high, resulting in draining of ZSTC funds. It is best that the GOZ consider agricultural crop insurance and pickers insurance scheme where by risk is equally shared rather than tax ZSTC for compensation.

2.7: The crop once plucked is collected by the pickers(who are paid 20-25 Tshs per frasilus) are sorted out by the family and hired labour force who squat around the mats removing the buds from the stem by holding the cluster and breaking it against the other palm. The buds are heaped on one side and stems on the other. The buds are then taken to a covered place where the tree owner or his foremen measures the green crop in a pishi and paid accordingly. An average picker earns about T shs. 400 per day. The owner permits his workers to erect simple huts on his property and furnish them with food twice a day for which he charges from the pickers earnings, it is roughly T shs. 400 per day. The owner permits his workers to erect simple huts on his property and furnish them with food twice a

day for which he charges from the pickers earnings, it is roughly T shs. 100 per day. These families stay for the entire season of harvesting.

2.8: The next stage in production flow is drying. Once buds are seperated from the stems, some dry in mats of palm leaves for 4-5 days during dry weather till buds change to deep brown and head light brown. If rainfall interferes with drying the process takes a longer period, in the open air-or in a shed. If cloves get wet they become dark and of inferior quality, thereby a good deal of essential oil is lost. These are known as the Khoker cloves. Drying fresh bud result in 67% loss in weight and roughly 3.1 - 3.5 kg of fully picked buds results in 1 kg of dried buds or 28 pishis of fresh buds yields 35 lbs. of dried cloves. In the clove stems the same percentage of loss of moisture results drying. The producers of crop leasers or land borrowers then bags and take the crop to Z STC purchasing centres by hiring donkeys or by truck. The lack of proper market roads results in great inconvenience and the collecter middlemen with the where withal exploits the situation to his advantage. Generally every produce pusher has to pay 10 Tshs. to local CCM Chairman to obtain permission to transport produce to the market.

2.9: The farmers collectors receives a permit by payment of a nominal fee to certify the ownership of produce. The document has the following format.

ZANZIBAR REVOLUTIONARY GOVERNMENT
DATE OF WRITIG
ISLAND
OWNER
QUANTITY
DESTINATION
DATE OF TRANSPORTATION
SIGNATURE
ADDRESS OF THE LOCAL GOVERNMENT OFFICER

Once the farmer collector brings it with his crop to the ZSTC purchasing centre a receipt is issued certifying the receipt of the consignment which is as follows:-

RECEIPT
NAME OF OWNER
LOCATION
QUANTITY
ZSTC BUYING CLERK

Then the cloves are taken from the bagsthe examiners posted at each purchasing centre by Kilimo. They ascertain the humidity and grade and decides on the

grade of his consignment, and if the farmer agrees with the grading ZSTC purchases the consignment and puts into ZSTC bags. If a dispute arises over the grades, there is provision for appealing to higher official or a committee who gives a decision within 1 to 3 days. ZSTC then informs the price to the farmer for the grade of his consignment of cloves, the ZSTC then issues a receipt to the farmer/collector for the consignment taken over by ZSTC which contains.

ZANZIBAR STATE TRADING CORPORATION		
OWNERS NAME		DATE
NUMERICAL NO:	SIGN	NO. OF BAGS
BAGS	KILOS BY WEITHT	
GROSS WEITHT.....YEAR.....NET WEIGHT		
	SIGNATURE OF THE WEIGHING CLERK	

This receipt is then taken to the payment documents clerk who after checking issues another documents which is follows:-

Date:

NAME OF THE OWNER

GRADE	NO. OF BAGS	GROSS	KILOS	TEAR	NET WEIGHT
I					
II					
III					
IV					

WEIGHING CLERKS NAME

GRADE	NET KILO	PRICE PER KILO	T.SHS.(AMOUNT DUE.
I			
II			
III			
IV			Total

This document issued by the weighing clerk and signed by the buying clerk. The buying clerk issues receipt which is taken to the paying cashier.

CASHIER

AMOUNT DUE T.TSHS. (IF BY CHEQUE)

(USUALLY PAID IN CASH) CHEQUE NO:.....

DATE OF PAYMENT .....

SIGNATURE OF PAYING CASHIER.....RECIPIENTS SIGNATURE

In the case of clove stems,once the prices are fixed by ZSTC in consultation with the Distillery, announcement is made by the Zanzibar Radio. The same procedure is followed and distillery also purchases directly at their godowns in Chake Chake.

It was observed that:-

(a) There is need to upgrade and improve the market and trunk road network. The 1990/91 GOZ budget has provided funds for road rehabilitation.

(b) There is a need to examine the feasibility of agricultural credit for clove other spices and essential oil crop growers through the People's Bank branches of Zanzibar or branches of the Cooperative and Rural Development Bank of Tanzania rather than dole credit by ZSTC which is a karketing organization.

(c)The function of importing and selling gunny bags, mats and lamps be given over to private sector under the OGL scheme other than ZSTC undertake it.

(d) There is a need for a agricultural crop insurance scheme for cloves and other spices/essential oil crop including picker risk insurance and registration of clove/spice/essential oil crop growers to be under taken by Kilimo and not be burdened on ZSTC. The issue of a Farmers Card may be worth consideration by Kilimo.

(e) There is a need for training of the ZSTC staff undertaking purchases.

(f) There is a need for greater vigilence and streamlining the laborious paper work which cost time and money to ZSTC.

(g) There is a greater need for improving drying technology at farm levels and timely harvests through publicity and education by the Kilimo in the Zanzibar radio,TV and newspapers.

(h) There is a need for produce examiners of Kilimo to visit farms during off season and educate farmers on upgrading the quality of their produce.

(i) There is a need for better supervision of bagging of cloves at the godowns before despatching to ZSTC godown in Unguja.

(j) There is need for discriminatry price revision in favour of grade 1 + 11 of clove buds grade 1 in clove stems and keeping grade III + IV purchase price for buds low and grade II stem prices low to encourage producers to up grade quality of their produce.

(k) The need to examine a price stabilization fund for cloves and the spices.

2.10: Once the produce is purchased ZSTC keeps the crop in gunny bags in 45 kg (net) bags using different colour twine to differentiate grades. Grade I bags are tied with white colour twine, grade II in blue , grade III in green and IV in red colour twine. The ZSTC has 7 godowns in Pemba with the following capacities:-

Table V: Capacity of ZSTC Godowns

Location	No. of Godowns	Capacity Tonnes	
Mkoani	03	I 540	
		II 900	
		III 720	2160
Chake Chake	02	I 900	
		II 3150	4050
Wete	02	I 360	
		II 810	1170
			7380

Source ZSTC Pemba.

The crop that has passed through the godowns between 1984/85 1988/89 is follows:

Table VI: Grader of Clove buds purchased and dispatched at Pemba Godowns

Season	Grade I	Grade II	Grade III	Grade IV
1984/85	67.505	28.395	4.056	0.044
1985/86	29.481	68.669	1.697	0.153
1986/87	71.689	28.247	0.064	-
1987/88	79.669	19.315	1.004	0.012
1988/89	61.077	37.374	1.485	0.064

Source: ZSTC Pemba

2.11: There was a greater need to upgrade the godowns and clean the produce purchased at the godowns. Large idle labour force was observed adding to overhead cost of ZSTC clove purchases. Transport was observed as a major contraint between purchasing points and godowns.

2.12: Once the ships arrive at Pemba the bulk cargo is despatched to the export go down at Zanzibar in Unguja, Islands, where bulking of grades are done to prepare a standard quality grade of clove buds, at thegodown. It was observed that quality control is done by senior produce inspector before exports, based on specifications. There is only exports of standard quality of buds and no export of special quality and distillation quality. It was observed that the standard Zanzibarian, Clove bud quality was better than the CG 3 quality of Madagascar. In this stage before bulk shipment, the chief produce inspector of the Kilimo get his labour force to pour cloves from grade 1,II and III bags and take samples from them. A bulk comprises of 250 bags (of 50 kg each). A samples are taken from each bulk and mix them thoroughly, from which 100 gram samples are taken as sample for inspection. The sample are seperated into stems, extraneous matter, mother of cloves and inspection for moisture content is done by the traditional method of breaking by finger nail. If the sample conforms to the standard

specification then a certificate is issued to the ZSTC for export. It was observed that:-

(a) There was a need for improved bulking and quality control procedures.

(b) Cloves for export should be selected on a "first come first go" basis to ensure minimum storage time and avoid congestion.

(c) The ODA has agreed to provide by end 1990 a mechanised system for cleaning cloves in the ZSTC godowns before export.

(d) The need for vigilence by ZSTC purchasing staff to ensure correct grading at source.

(e) The need to arrange clove buds received at Zanzibar godowns into different grades to ensure smooth examination.

(f) There were no trained back up staff to the Chief produce inspector.

(g) The Chief produce inspector requires a small laboratory with necessary equipment especially since buying countries like Japan is insisting on micro toxin analysis certificated.

The clove stems are purchased by ZSTC and transported directly to the clove distillery and clove distillery also purchases stems by grades when producer/collectors offer directly to them. Grade IV clove buds purchased by the ZSTC is also sent to the clove distillery at Chake Chake for oil distillation.

2.13: MARKETING OF CLOVE OILS

The clove stem oil and bud oils once distilled are packed in steel drums of 220 kgs lacquered inside. The drums are transported from the distillery to the Pemba export godown at Wete from where they are transhipped to Unguja port ZSTC godown. Once an export order is received , the ZSTC submits samples of the oils to the Government Chemists for analysis based on whose report the Chief Produce Inspector issued a certificate of quality for export by the ZSTC. The Wharfage Corporation of Zanzibar undertakes loading of drums to small seooners which carries the cargo to Dar es Salaam ZSTC godown from where they are again loaded to ships for exports to destinations.

The following observations and recommendations are possible regarding the whole process.

(a) There is treble handling of cargo from the distillery to the export point, which adds to the cost.

(b) Once the port development work in Zanzibar port with the EEC funding is completed in March, 1991, international ships could collect the cargo from Zanzibar port rather than tranship it from one godown to another four times before exporting.

(c) The lifting of clove oil drums at the ZSTC godowns at Zanzibar needs to be upgraded by provision of a fork lift to avoid damages to the drums.

(d) New bust steels drums (220 kgs.) should be used with inner resin coatings for clove oil and old drums should not be used for export orders. The drums be labelled at the distillery giving

(a) Lot No.....Numerical No.....

(b) Date of Distillation.....

(c) Country of origin.....

(d) Eugenol content ..... Colour.....

(e) Marks

(f) Net weight.

(e) Each drum should be numbered numerically for each lot sent to Godowns in Zanzibar so that the Chief Inspector of Produce could compare them with the results obtained from the Government chemist.

(f) The Government Chemist who certifies the quality of clove oils and in the future other essential oils needs to be strengthened by provision of laboratory equipment and chemicals. The existing equipment is old and defective especially the shaker used for clove oil analysis. The chemicls are old and the chemist find it is difficult to get new chemicls . The chemists were eager to procure literature and methodology adopted in other countries using modern methods. UNIDO could ascertain their needs for literature ,chemical laboratory equipment and training abroad in the field of essential oils, and render assistance through the project. It was very evident that the chemist and his assistants has never visited the Pemba distillery.

2.14: THE MARKETING DIVISION OF THE ZSTC

The marketing Division of the ZSTC is directly under the General Manager ZSTC. The division is managed by a marketing Manager (on two years study leave in Dar es Salaam), a Deputy Manager (who now heads the division with 20 years experience in the ZSTC) and four marketing assistants. The assistance together with the Manager attends to routine work, export documentary work, forwarding of samples, laision with buyers, arranging shipments, arranging items for display at Trade Fairs attended frequently by Ministry of Trade and Industries officials or Tanzanian Embassy official abroad or by the Board of Trade of Tanzania. They also undertake retail sales of cloves, clove oils to tourists and local buyers. A small secretarial services the division.

2.15: The staff in division is only engaged in selling and not marketing of cloves and clove products. They lack the training and orientation for aggressive marketing. The marketing staff needs exposure, at Pemba Distillery regarding the products they are trying to promote. They lack the basic knowledge of the technicalities of processing, product process, product specifications, capacity of the distillery to meet any order etc. They are trying to promote a technical product to technically oriented buyers without knowing the product they are trying to promote. Whatever they have gathered is through experience, and are heavily dependant on the distillery Manager and the ZSTC General Manager.

There is no physical participation by the division officials at Trade Fairs where they could develop contact with buyers. The only contact they have with the buyers is through the telex which during the Mission was non operative for over a month. The division has no Fax Machine, no Computer, no Photocopy machine, no market information library. The only source of information is the 'Public Ledger' and spice prices they receive from ITC information service. They are not receiving prices of spice oils from the ITC and the UNIDO marketing expert telexed ITC to submit such essential oil prices to the division reguarly through the Telex. There are no publicity materials for product promotion and the expert had to train them in preparing a comprehensive business letter to be submitted to prospective buyers, which is now been followed by the division.

2.16: The clearing and forwarding Division is under the marketing Manager and it has a head and five assistants. The godowns are under a godown superintendent reporting direct to the ZSTC General Manager. The Chief Inspector of produce from the Department of Agriculture, research and Extension and the Government chemists services the division whilst the Zanzibar Wharfage Corporation handles the products at shipment. Apart from clove buds, clove oils, the division also handles birds eye chillies, and copra.

2.17 : It is recommended that the following be implement through the UNIDO project to orient the division in marketing and meet the challanging needs of marketing other essential oils with diversification.

(a) Internal Training

ZSTC should ensure that the officials of the marketing division are trained at Chake Chake distillery at Pemba , when it is operation, so that they will get a first hand knowledge of the product , product processing and product specifications. This training be at least for one week under the plant Manager.

(b) Training Overseas

(i) The acting Marketing Manager be trained with UNIDO in Major essential oil distillation and marketing companies in India (like Kalkut) France and the U.K. in their marketing departments. He needs to be attached with the major buyer of clove oils in the U.K. John Keeley's Ltd., and other brokers possibly with L.A. Champon New York USA, Paul Karders Gmb in Germany. The Essentioal Oil Association of India, Adrian in France and possibly with the International Federation of Essential oil association. In the trading department , price analysis, trade documentation, shipping etc.

(ii) The Asst Marketing Officer who has been recently is ideal material for training in marketing and market research. He could be attached to the

International Trade Centre, Geneva, the overseas Development Natural Resource Institute. Commodity Economics section U.K., the public Ledger, Turret Group PLC UK. This Officer needs to be trained in price analysis, use of computer for preperation, analysis and presentation of market information.

(iii) The other Asst. Marketing Officer could be trained by ITC/UNCTAD/GATT in Public relations, sales promotion, advertising, packaging, preparation of sale promotion material, trade fair display etc.

(c) Establishment of a market Information library.

The project oould assist ZSTC by way of funding the procurement of books and publications, technical journals specified in Annexe 12.

(d) Provision of Marketing Service facilities

It is recommended that the Division be equipped with the following facilities through the UNIDO project.

(i) Fax machine with internal fax facilities with the distillery at Pemba.

(ii) A plin paper photocopies machine.

(iii) An electric typewriter.

(iv) A micro - computer.

(e) Assistance to Marketing Facilities

The project needs to assist ZSTC to procure and additional fork lift to handle drums at the

to facilities transfering them to ships.

The chief chemists and his deputy be assisted by way of training, chemicles, equipment and literature on analysis of other essential oils.

Procure the assistance of a professional promotional materials.

2.18: MINIMIZING SHIPPING DELAYS

There are no direct ships that take charge from Zanzibar for destination markets. Thus, ZSTC depends on scooners for transhipments of the cargo to Dar es salaam international port from where they are shipped. This undoubtedly involve handling of cargo at several points, encourages rist of damage to cargo and also delays has caused letters of credit opened by buyers to lapse, unless they agree to extend the validity. Such lapses have affected ZSTC's marketing of produce and affected its reputation as a reliable and regular supplier. There are three solutions to this problem:-

(a) Have adequate stocks with a sole agent to meet immediate demand for stocks at short notice, when samples and prices are accepted by buyers immediate execution of orders could take place from such agents in the region once the ZSTC marketing division telexes or faxes the agent;

(b) In the case of a direct buyer say like Feminish in Switzerland prompt supplies could be made from ZSTC stock stored at the ZSTC godown at the Dar es Salaam port once the marketing division notifies them.

(c) To get the port development accelerated and completed so that international ship can call over for cargo.

2.19: The clove oils are now market through a contact in the U.K. through an informal arrangement and certain recommendations on sales and marketing promotion would discuss this aspect in detail.The dealer is promoting Zanzibarian clove oils and does not feed the ZSTC even with his weekly published market report. Certain direct sales are also made by ZSTC to perfume manufacturers in Grasse France (B.F. Aromatique) and Fremirish in Switzerland. The UNIDO funded visit of the Distillery Manager and the MArketing Manager to the International Essential oils conference in New Delhi in November, 1989 has resulted in trade inquiries for clove oils from several sources. Such exposure of the Marketing Division staff would pay rich dividend through personnel contacts.

3. MARKETING AND SALE PROMOTION OF ESSENTIAL OILS WITH SPECIAL REFERENCE TO CLOVE OILS

3:1: Marketing and sales promotion of clove oils and other essential oils is the sole reponsibility of the ZSTC of the GOZ. The present practices of trade and marketing of spices and essential oils were discussed earlier in the report. Certain recommendations have been made regarding controllable internal factors which ZSTC and the UNIDO project should give immediate attention. In this section, the expert would chalk out the marketing and sales strategies that could be adopted for promoting Traditional exports of essential oils, and new products like derivatives and new essential oils which the Chake Chake Distillery could undertake.

THE APPOINTMENT OF AGENTS.

It is the present practice for the ZSTC to supply clove oils when some one makes an inquiry. Only one promoter of essential oils in the U.K.who also deals with competitors oils like those of Indonesia, are possibly Madagascar who through his interest, and due to the quality of Zanzibarian oils have been able to promote clove oils so far. The relationship has not been formalized. The dangers of not formalizing any sole agency arrangements by ZSTC are:

(a) There is a sole dependency on a single promoter of the single commodity the country export most.

(b) The risk of his interest declining.

(c) The risk of his taking up promoting more of similar oils from countries offering better incentives and trade bonuses.

(d) The risk of buying at a certain price transferring to buyers at a transfer price to his advantage.

(e) The risk of using Zanzibarian quality clove oils and blending with cheaper oils for sale as Zanzibarian oils.

(f) The risk of concentration in one regional market with no market diversification.

Therefore, ZSTC should seriously consider formalizing the relationship and appointing him as the formal sole agent for the U.K. and the EEC market and work out necessary trade incentives for promotion of more business.The idea of having many agents in a region will not be advantages to Zanzibar. Similarly, ZSTC should consider appointing another agent for promotion of clove oils and similar essential oils in the American market preferable in New York to cover the USA, Canada and the South American markets.

Another area of importance would be the Japaneses, People's Chinese and the Oceania. a dealer/agent from Singapore would be ideal to cover such markets.

Another growing markets is the USSR, Eastern Europe and the Middle East. An agent either from Bombay, India or the Gulf area could care the regional market.

The ZSTC marketing division should concentrate its efforts to find potential buyers in the African Continent especially those toothpaste, pharmacentical liquer, tobacco, perfumery, soap and other possible users. The criterion of selection of sole agent to promote ZSTC products should be:

(a) The previous record of business in spices and essential;

(b) The recommendation of the chomber of commence or essential oils/spice Association in the region or the country;

(c) The last two year audited annual report of the company;

(d) The target volume of trade in spices/essential oil assured in the markets;

(e) The possibility of servicing ZSTC by way of price and market information;

(f) The facilities provided to the client;

(g) The maximum stock of commodities he could handle at any time;

(h) The capacity to promote trade;

(i) The Bankers reference;

The advantage of having a single agent for the marketing region are:-

(a) The agent could concentrate has effort solely to push ZSTC spices/essential oils.

(b) He will not have to duplicate efforts if there are many agent;

(c) The potential buyers will not be confused who is representing whom;

(d) There will be single stable price in the market and no price war would occur as a result of having too many agents;

(e) The agent would be able to develop the image of the ZSTC as a reliable and reputable supplier.

There are many disadvantages of having many agents in a single markets region.

(a) No one agent would bother to push the product since each will think the other would do so, as a result of which volume of trade would be affected;

(b) Different agent would give different prices for the same product in the same market;

(c) Confusion among buyers would arise;

(d) No one agent would be able to build in image for ZSTC

(e) Every body's efforts would be duplicated .

The expert advices ZSTC to only appoint one sole agent to a carved out market area.

3.2: OFFER A PACKAGE OF ESSENTIAL OILS AND SPICES

At present Zanzibar offers only clove and clove oils to the markets and with possible diversification it could offer a package of essential oils and spices that could interest buyers to purchase from Zanzibar. A basket of essential oils and apices could also cushion any ill effects in price fluctuations of one commodity as against rise in another. Another fact to this strategy is the need to diversify into clove derivatives like eugenol, iso-engenol , vanillin and terpenes. If a policy decision can be given for the distillery to collect broken leaves and twigs during the harvesting season, then it could distill some amount of the clove leaf oil for export.

3.3: UTILIZING THE SERVICES OF THE TANZANIAN EMBASSIES ABROAD.

Although at present Tanzanian embassies services the ZSTC by forwarding any inquiries for cloves, and clove oils,it gives a greater attention to promoting the mainland products than Zanzibarian spices and essential oils. This wasthe feeling among most Zanzibarians the expert interviewed. In order to promote Zanzibarian products there should be Zanzibarian Trade Councellers in their Office in Tanzanian Embassies in the U.K.,USA,Singapore and a selected Middle East Embassy to look after their interests. With limited basket of goods for export greater attention will have to be given to economic survival of Zanzibar. The ZSTC should simultaneously keep the Tanzanian Embassies abroad

informed of the product availability, supply situation, prices, specifications so that they would be in a position to help ;and such Embassy staff should be able to provide ZSTC on developments by various competitors including trade information , prices, promotional materials, news appearing in the trade press, journals etc.

3.4: UTILIZATION OF BILATERAL TRADE RELATIONS

Zanzibar has been dealing on barter trade with Singapore offering cloves to import certain commadities. India does so with the USSR in black pepper, and lemon grass oil.ZSTC should explore the possibility of barter deals with the USSR, East Europe, India, PR China to import its rice, wheat flour, sugar,textiles, machinary, industrial raw material in exchange for clove and other essential oils. The ITC /GATT and the FAO Commodity division should be able to provide ZSTC information regarding the trends and prices of such commodities like sugar, rice, flour, dairy products etc.

3.5: PARTICIPATION IN SELECTED SPECIALIZED TRADE FAIRS AND TECHNICAL CONFERENCES, WORKSHOPS, SEMINARS

It is vital that at least at General Manager or Distillery Manager or at Marketing Manager level there must be personal participation at Trade Fairs, Technical Conferences, Workshops, Seminars at international level in order to get trade contacts and offer samples with a view fowards promoting essential oil sales. Trade stalls

in such Trade fairs should be well prepared on a professional scale, with colourful pictures depicting the whole processing of oils, samples of essential oils,technical specifications, leaflets, brouchers, simple spice boxes with traditional Zanzibarian designs with clove and other essential oils could be easily sold at such trade fairs. The possible uses should be given in detail in the English, French, German or Japanese language. The theurapatic value of clove oils as mouth wash, etc can be given in the explanatory note. The representative at the Trade Fair, Technical conference should be authorised to make necessary contact and finalize a trade deals should the need arises. A good example of such a strategy is the inquiries and orders that are flowing into ZSTC as a result of the trade contacts made at the International seminar on essential oils held at New Delhi in November, 1989.

3.6: MEMBERSHIP OF INTERNATIONAL ASSOCIATIONS

The international bodies are another media to contact traders and users because both national and international traders show great interest in the activities of such trade associations. They monitor the product quality, trading procedures and draw up specifications for individual products. Such associations are:

(a) The Flavour and Extract Manufacturers Association (FEMA) in the United States.

(b) The International Federation of Essential oils and Aroma Trade (IFEAT) based in London.

(c) The General Produce Association of the U.K.

(d) The American Spice Trade Association.

It may be worthwhile for ZSTC to contact these Associations and keep them informed of its interest in promoting trade amongst its membership. Similarly there are essential oil Associations in major importing countries which ZSTC should create linkages. Examples are:

(a) All Union scientific Research Institute of Essential oil plants in USSR.

(b) Pollena - Aroma Fragrances and Flavour in Warsaw, Poland.

(c) European Chemoreception Research Organization.

(d) International Fragrance Association (IFRA) Geneva, Switzerland.

(e) Internatioanal organization of the flavour industry(IOFI) Geneva Switzerland.

(f) Essential oil Association of India.

(g) The perfumers and flavour Association of India.

(h) Italian Experimental Stations on Essential oils at Reggio, Calabaria, and at Milan.

(i) Societa Italiana La Horazione Estralti Aromatics, Torina .

(j) Italian Flavours and Fragrance Industry- Federchimica Milana, Italy.

(k) Guarngdone Native Prudece Import and Export Corporation Group. Essential oil and spice Co.

Guanyzhoce Peoples Republic of China

(l) National Federation of Italian Chemical Industries (Federchimica)

(m) The Bureau de Liaison de Syndicate Europeans des products Aromatiques

(n) Japanese Essential oil Association

Apart from linkages with national essential oil association', a comprehensive business like letter with presentable brouchers should also be dispatched to Chamber of Commerce of selected countries.

3.7: INVITATION OF AGENTS/BUYERS TO ZANZIBAR AND PEMBA DISTILLERY

It is reported by CTA in his report of January, 1990 " A wide publicity on the availability of this oil on a regular basis is called for" (p.4). Whilst publicity is made it is necessary for ZSTC to extend invitation to buyers/agents to visit Zanzibar and the Pemba, Chake Chake Distillery and see for themselves the production capability, crop cultivation etc . to ascertain the reality of the existence and the availability of clove and other essentials from the distillery. This needs to be well planned and handled at the highest level.

3.8: ADVERTISING AND PUBLICITY

Having a high quality product without potential buyers not knowing it would never increase sales. It is, therefore, recommended that publicity and advertising on Zanzibarian Essential oils be done in the following journals. Preliminary expenditure for this may be borne by the UNIDO project with provision by ZSTC for subsequent publication from its foreign exchange earnings from essential oil sales:

(i) Product Service Booking/Commodity Weekly
Public Ledger
Andrew Everson
4, Kingly Street. London W1 U.K.

(ii) Chemical Marketing Reporter
Schnell
100, Church Street
New York, N.Y. 10007, USA.

(iii) Purfumerie Und Kosmetik
Postbach 10 28 69
6900 Heidelburg
Federal Republic of Germany.

(iv) Parfums Cosmetiques Et Aromas
5, Rue Jules- Lefebure
75009 Paris
France.

(v) Perfumer and Flavorist International
Alterred Publishing
Box 318
Wheatom
Illinois 60187 USA.

(vi) Indian Perfumer
C/o HBTI
P.O.
Nawabganj
Kampur 208 002
India.

(vii) Japanese Cosmetic Science Journal
6 - 2 - 10 Hongo
Bunkyo - ku
Tokyo - 113
Japan.

Encouragement should be given by ZSTC to the plant Manager to contribute technical analytical articles to technical journals and even read research findings at International Conferences, Seminars and Workshops. ZSTC should prepare a short article, assisted by the Marketing Expert, to publicize its cloves and essential oils in "Forum" a journal published by the International Trade Centre/UNCTAD/Gatt with internationl coverage.

Another mode of advertising is to promote gift packs to tourists visiting Zanzibar at the Airport, leading Hotels, through stickers, Airline advertising, tourist posters etc. The Kizimbani Experimental Station with many varieties of spices could be a tourist attraction to see the "Spice Gardens of Zanzibar" where gift packs could be sold for foreign exchange. Tourist hotels could be encouraged to popularize among foreign visitors clove flavoured coffee, beverages and drirks.

"Pilow" and "Buriyani" with cloves, cinnamon, ginger, pepper could be a popular food in Zanzibar and Tanzanian tourist hotels.

3.9: PREPARATION OF A TV DOCUMENTARY ON SPICES AND ESSENTIAL OILS

A quality video film on clove and other essential oil cultivation in Pemba and Unguja should be prepared professionally to be shown to international audience at International Trade fairs, International Conferences, Import Promotion offices in developed countries, and through national TV as a documentary combining with the Tourist pontential of both islands. The funds for this should be borne either by the project or ITC/UNCTAD/CATT, the ODA or the EEC.

The rationale

(a) Zanzibar as a spice and essential oil producer has suffered over the past two decades due to competitive growth and Zanzibar's own lack of commercial acumen

(b) This video is focused primarily at the agents/buyers in international markets and wider consuming public will restore their confidence in Zanzibar as a reliable source of spices and essential oils

(c) Suitable to be shown at Trade fairs, conferences and at a permanent spice centre run by ZSTC in collaboration with the Tourist authorities at the Zanzibar town.

Suggested video content:

15 minutes.

Depiction of the extensive care going into spice and essential oil production for flavours, perfumes and other uses, from cultivation, processing marketing and industrial usage.

3.10: USING FACILITIES OFFERED BY IMPORT PROMOTION DEVELOPED COUNTRIES

There are many Import Opportunities Offices of the various Industrialised countries assisting developing countries to promote exports. JETRO in Japan, Impod organisations in Finland, Sweden, Norway, Netherlands, Denmark, Germany are possible trade promotion avenues ZSTC could utilize to promote spice and essential oil exports.

3.11: PRODUCTION OF A STAMP SHOWING CLOVE OIL DISTILLERY

Another strategy to promote cloves and essential oils is to produce stamps of 5 Tsh, 10 Tsh, 20 Tsh with the Zanzibar island and the clove oil distillery. This is yet another indirect means of advertising Zanzibarian cloves and essential oils. The message "Quality clove oils from Zanzibar" may be printed on it.

3.12: JOINT VENTURES AND FOREIGN INVESTMENT PROMOTION

Another strategy that could be explored for marketing and sales Promotion is to explore the feasibility of

a joint venture between ZSTC and a foreign investor who could utilize any one of the following models.

(i) Joint equity participation with ZSTC holding 51% of share in the joint venture in the form of assets of the distillery and 49% to be shared by the foreign investor to distill other essential oils, derivatives and operate a Nucleus plantation with outgrowers.

(ii) Technological agreement whereby the foreign partner would provide technology for added value product manufacture.

(iii) Marketing agreementwhere the joint venture partner jointly markets essential oils and derivatives in target markets. Indonesian firms have collaborated with firms in Netherlands on joint ventures. Similarly French firms with Madagascar, Japanese firms with Malaysia and Brazil, have entered into joint production, processing and marketing of essential oils.

(iv) Managerial agreement whereby a reputed foreign partner takes over the management of the distillery on a commercial footing on an agreement and a fee based on earinings from the distillery products.

The Investment Act 1986 and the Guidelines for Foreign Investors in Zanzibar published in March 1989 provides for:-

(i) Foreign investments and private investments in spice cultivation (Chapter 3 p 5) and

(ii) Essential oils, perfumery and pharmacenticals based on clove stem oil (Chapter vip. 7)

The Act has not been well publicized abroad. It provides for:

(i) Investment Protection under Section 14 Pat IV of the Act and the Article 17 of the Zanzibarian Constitution..

(ii) Lease of land for 99 years.

(iii) Preferential rental for land for investors who uses local raw materials or who locates the project in less developed or deprived areas like Pemba.

(iv) Investment relief.

(v) Exemptions from custom duty, import duties and similar taxes on machinery, equipment, spareparts, fuel, raw materials vehicles and other goods for the project construction..

(vi) Exemption of goods imported for use by the expatriates in the first six months.

(vii) Finished products destined for export are exempted from export duties and similar other taxes.

(viii) Reinvestments of profit are exempted from income tax.

(ix) Investment allowance benefits for reinvestments.

(x) Transfer of capital, profits after taxes.

(xi) Financial allocation available for purchase of raw materials, spares, consumables not found in Tanzania, business travel, managerial fees, salaries etc.

3.13: JOINT GENERIC PROMOTION AND MARKETING OF CLOVES AND CLOVE OILS.

The Revolutionary Council at a meeting held on December 13, 1988 agreed that:

- the General Manager of the ZSTC together withthe Ministers of Finance and Trade should be permitted to negotiate clove prices with buyers and to enter into contracts.(This is being followed presently).
- the ZSTC would be permitted to appoint sole agents for marketing Zanzibar cloves inthe major market areas:(This is yet to be implemented)
- efforts should be initiated by Zanzibar to establish a dialogue with Madagascar aimed at the possible development of an agreement on a cloves pricing and marketing policy.(The GOZ have asked the Ministry of Foreign affairs to explore possibilities)
- funds could be made available for research into ways of increasing the utilization of and income from cloves.

It is recommended the ZSTC contact the Malagasy state Trading Corporation through the agecie of the Foreign Affairs, International Trade Centre/UNCTAD/ GATT and start discussions on a joint generic

promotion of cloves and clove oils. If Indonesia, Comoros, Brazil, Sri Lanka , can be brought together through the efforts of the ITC/UNCTAD/GATT with UNIDO collaboration an International Cloves and Clove oils Community could be established in Zanzibar for the following purposes. The Marketing Expert could collaborate with the UNIDO/ITC/UNCTAD/GATT and with the Commonewealth Secretariat to initiate action in this regard, if requested.

The International Clove Community could:-

- provide or forum for consultation and exchange of information between production and exporting countries on issues relating to production, processing, exports, marketing and consumption of cloves, clove oils and derivative etc;
- identify current and future problem areas relating to international trade through cooperative efforts seek appropriate solution for the mutual benefit of the exporting and importing countries;
- promote a mechanism that would ensure the availability of market intelligence and commercial data relating to international trade in clove and clove products by initiating relavant studies on the product availability marketing and imports and by dissemination of the results of these studies.
- encourage appropriate market development activities for existing and new products through product and market research through grading improvements,

quality control, packging, transportation and distribution of clove and clove products.

- encourage action as may be required to reduce or eliminate barriers affecting trade in clove and clove products;
- seek coordination with various national and international research and development activities related to clove and clove products in the implementation of the above objectives and avoid duplication of work and
- take such other activities as if may consider appropriate to carry out the above objective including reasing of necessary funds through appropriate agencies.

4. PROSPECTIVE PRODUCTS OTHER THAN THOSE TRADITIONALLY EXPORTED

4.1: In analysing the prospective products other than those traditionally exported from Zanzibar the criteria adopted included the market prospects, knowledge of the crop in Zanzibar, agronomic possibility, the capacity to encourage small holder development and the possible utilization of the crop in the existing distillery. The mission will make his recommendations for short term and long term development of such products.

CLOVE OIL DERIVATIVES: PRODUCT DIVERSIFICATION

Zanzibar has been an exporter of clove buds since the introduction of clove plant by the Omani merchant Saleh.b.Haramil al Abray at the end of the neneteeth century from Bourbon to Mtoni and to the Guillain at Kizimbani and the direct lead given by Sultan Seyyid Said after 1828 and the introduction of cloves to Pemba in 1872. After 1930's the Zanzibar under the Clove Growers Association has been exporting clove stem oil from its distillery at Malindi, Unguja . It exported between 1941-1948, 40040 - lbs of oil annually (187 tonnes) (Vide: R.O. Williams: General Manager, Clove Growers' Association Annual Report 1949). The plant ceased exports in 1967. In 1983 a Modern steam oil distillery was established by the ZSTC in Pemba , Chake Chake, where production of clove

stem oil and from 1988 clove bud oils are distilled for export through the ZSTC.

4.2: Within the existing production capacity staff, plant product diversification are possible within the clove range. They are

(a) Clove Leaf oil;

(b) Clove derivates like Engenole, iso-engenol, iso-engenols and TERPENES

(c) Clove oleoresins (with an addition of a solvent-extract plant.

CLOVE LEAF OIL

The production of clove leaf oil is possible from the broken leaf, twigs, dried fallen leaves. But the Kilimo has been against this because it feels the people in their drive for cash, would harm the clove trees, thereby affecting the clove crop, increasing the higher incidence of diseases and reduction of leaf mulching around the clove tree which minimizing moisture strains to the plant. If the ZSTC would, at some stage agrees to undertake the production of this oil , in is desire for foreign exchange, then the market analysis, made here would , it is hoped would throw some light. One strategy to reenter the US market may be introduction of clove leaf oil of high quality from Zanzibar. This is a policy

decision which ZSTC should take even though a market exists and the Chake Chake distilery has the capacity and capability to distill a high quality clove leaf oil. The current world market for clove leaf oil is around 1800- 3000 tonnes per annum. The current prices are around US $ 2600-3600 per tonne (cif) for Indonesian (mini 80%) and Madagascar (minimum 82%) leaf oils. Themarkets are in the U.S.A. , France, Federal Republic of Germany, Japan and other European countries.

4.3: CLOVE DERIVATIVES

The other possibility is to produce added value products from low quality stems and buds, Engenol, iso-engenol vanillin and terpenes. Indonesia, at present produces these from clove leaf oil and exports to the USA. If Zanzibar wishes to avoid clove leaf oil it could yet attain the same result, using low quality clove stems and clove buds. This will produce the following advantages:

(i) All stems and buds (Grade IV) could be purchased at reasonable prices adding income to farmers;

(ii) It will add additional products to the basket of products now on offer from ZSTC Zanzibar;

(iii) It will help to utilize the capacity of the Chake Chake Distillery at Pemba;

(iv) It would earn ZSTC additional foreign exchange.

The largest market for Engenol and iso- engenol is in the USA which import around 100 Tonnes valuing US $ 668,000 which works out to $ US 6.68 per kg (Tsh 1336 per kg.). At present supplies come from France, Spain, Indonesia and others. The price variation in the New York market in 1989 has been in the range of US $ 4300-6200 per tonne. The recent price quoted in New York market is US $ 6.98 per kg of Engenol (99/100%) and iso-engenol US $ 4.25 - 4.50 per lb (May 1989). .

Table VII gives import into the USA:

Table VII Enguenol and Iso-engenol import into the USA: 1978 - 1982

	1978	1979	1980	1981	1982
Total Tonnes	32	36	60	103	99
$ US ' 000	620	449	630	227	668
SOURCES					
France - Tonnes	23	16	7	11	-
US $ ' 000	134	89	46	51	-
Spain - Tonnes	-	-	10	-	-
US / ' 000	-	-	43	-	-
Indonesia - Tonnes	-	10	38	86	95
US $ ' 000	-	49	146	310	409
Others - Tonnes	10	10	4	6	5
US $ ' 000	189	74	37	37	31

Source: US Department of Commerce

There is also a possibility of coverting some clove stem oil into Vanillin.

Since clove stem oils in Pemba has a high percentage of engenol, the clove engenol may be converted into vanillin by a two step process. The world demand for synthetic vanillin is estimated at around 8000 tonnes per annum. Natural vanillin has completion from lignin derived vanillin which is a by- product of wood pulping industry. This is a cheap product and at the cost of wood based vanillin, it was not possible for clove based vanillin to complete. However, in the opinion of the trade vanillin devived from clove engenol is reported to be preferred by the food industry because of its natural raw material origin, superior aroma, flavour profile as against wood pulping residue vanillin. The price of synthetic vanillin in 1989 was around US $ 16 per kg. At present it is US $ 17 per kg (US $ 7.25-7.50 per 16 New York May 1989). It US $ 17 per kg is taken as the going price, then in order to produce vanillin from 1 kg clove stem oil would be US $ 1. To produce one kg clove oil (Break ever cost) at Pemba distillery is US $ 3.05 . Since 2 kg of clove stem oil goes to make 1 kg of vanillin it would cost US $ 6.10 + US 1.00 = $ 7.10 per kg of vanillin and it can be sold at US $ 17 per kg. Thus , convertion of clove stem/bud oil from Grade II & IV to vanillin

would be a profitable proposition. The other rational is that the additional capital expenditure required to equip the Pemba distillery with a processing unit to convert clove stem oil into vanillin would be relatively small. Additional reason is all clove stems + low quality buds offers could be used to produce clove oils to produce engenol, iso engenol and vanillin thereby increase the capacity of the distillery to two shifts per day. Moreover for conversion of clove stem oil into vanillin the quality of stem purchased from farmers will not be critical. Clove terpenes would also be a by-product for export. Therefore, ZSTC needs to give serious thought to product diversification within clove oil categories.

4.4: CLOVE OLEORESINS

Clove oleoresins are prepared from the buds and stems of the clove tree (Syzygium Aromalica) (syn. Engenia Caryophyllus). This is one of the lower valume oleoresins. The leading manufacturers of clove oleoresins are the U.S.A. (5-10 tonnes production per year), the U.K. (2 tonnes per year), France, the Netherlands, Canada and Singapore (5-8 tonnes). The total world production is estimated to be little over 15-20 tonnes per annum.

The USA absorbs 50% of the world supply. Remaining important markets are the U.K. and the Federal Republic of Germany.

Japan uses a very small quantity.

The limitations faced by clove oleoresin market is the preference for clove essential oils in many applications. Growth in demand in clove oleoresin market is slow.

LEMON GRASS OIL

Locally known as Mchani which is brewed and drunk as tea, lemon grass (Cymbapogon citratus stapf Gram) is growing very well in Pemba and the oil distilled at the Chake Chake distillery from the local varieties gave a yield of 0.3 - 0.4% oil in a batch of 2-2 hours steam distillation , having 77% citral content. New cultivers from India especially the Variety CIMAP /LS 48 with 50% yield. Lemon Grass has been one of the worlds best known essential oil and for many rank among the most important in terms of quantities used. It is a yellow or amber liquid obtained by steam distillation of the grass of the Cymbopogan family namely Cymbopogan flexuosus stapf which is indegenous to South Asia and Cymbopogon citrus stapf which is cultivated mainly in the Central and South America although it is also known in parts of Africa, South East Asia and Indian Ocean islands. C.T.A. has identified the variety in Pemba as Cymbopogen citratus. The oil obtained from those spices have traditionally been known as 'East Indian' lemon grass oil respectively but though there are

C.T.A. has identified the variety in Pemba as Cymbopogon citratus. The oil obtained from those apices have traditionally been known as 'East Indian' lemon grass oil respectively but though there are undoubtedly noticeable differences between the two oils, in practice now the distinction is far less important in the trade than that was so two decades ago.

Lemon grass all possess a strong odour with a basically know like character though it also exhibits herbacious verbaria - like notes, not possessed by for example lemon oil. The lemony character is due to its high content of the aldehyde citral which should in general account for at least 75% of the oil constitution. Lemon grass can either be used per se as a complete oil in its own right or as a route to the isolation of citral. The citral can be further processed to isolate a group of chemicals known as the ionones.

The current trend is for lemon grass oil to be used mainly applications include aerosal deodorants, floor polishes, household detergents and a whole range of domestic and industrial products which a pleasant fresh fragence is derived, whether in its own right

.or as a mark for unpleasant odours of certain active ingredients. There are one or two flavour applications but these are of insignificant importance in comparison with fragrance work.Certain animal feedstuffs, bakery products and confectionery products incoporate lemon grass oil but the quantities are extremly small and it is very much the exception rather than the rule lemon grass oil as a flavouring agent, especially as in much cases lemon oil as a flavouring agent, especially as in much cases lemon oil will produce a better effect at little extra cost. Though terpenless essential oil are important in some areas of perfumery and flavouring the deterpenation of lemon grass oil is very rarely, if ever, undertaken.. There has been a generally tendency for perfumers to move away from the relatively simple type of perfume which used to embody relatively large quantities of cheap oils such as lemon grass oil and citronellaoil.Therefore, there has been a definite decline in the use of lemon grass oil in the aforesaid application.. Yet lemon grass oil as a source of a citral is important and hence of ionones.

Lemon grass oil is facing competition from Litsea Cubeba oil, a citral rich oil produced in China from the seed of a fruit. The oil is generally cheaper that lemon grass oil. It is now widely traded and is widely used. Its continious supply from the People's Republic of China is uncertain. This gives some optimism to lemon grass oil producers. The litsea cubeba oil can be used per se in fragrance and in rather high quality and higher value products then the lemon grass oil. However, it is used as a sourse of citral and as also a source of ionenes and vitamins. It is reported that citral ex-Litsea cubeba oil is best available in terms of odour though it can contain traces of citronellel which is occasionally undersirable. The largest proportion of the world's production of citral ionones and their relavant vitamins are derived from sysnthetic sources such as terpentine via its components B - pinene and more recently α-pinene) and petro chemical based hydro carbons mainly acetylene. Isoprene was another source of the same derivatives but in practice it has become economically non-viable. Synthetic citral is considered less good then natural derived citral, though they are highly competitive in terms of price in spite of the upward trends in petroleum prices. However, as a result of the

steady improvements in the techniques of extraction and isolation of the physics -chemical properties, odour and flavour characteristics of the derivaties of lemon grass oil, litsea cubeba oil, turpentine and hydrocarbons differ from one another to a far smaller degree than was the case a decade ago. The choice today is based on economics. AT present lemon grass oil is used for the extraction of the derivatives where special technical or organoleptic considerations rather than economics dictates.

The world market for lemon grass oil is 500-1000 tonnes from as high as 1500-2000 tonnes in the 1960's.The main producer of lemongrass oil is India especially after theUNIDO assisted Lemon Grass project in Kerala. A large proportion of lemon grass is consumed in India domestically either in its own right or for the extraction of citral and other derivatives. A strain of Cymbopogon pendulus developed by the CIMAP of India has more than 85% of citral and gives 100% more oil yield than any other strain. it is said to be hardy and suitable for marginal and not marginal soils including wastelands.A strategy for Zanzibar would to get these cultivars without depending only on wild strains. India soap and fragrance manufacturers popularly use lemon grass oil and extract citronellal ex-Lemon grass to make citronellel and hydroxycitronellal.

India was a dominat exporter but declined to a second level to Guatamala due to the growing domestic Indian market for lemon grass oil and for its derivatives. It also did so because of the steady development of trade with the USSR by means of barter agreements and thus, the USSR, became Indian's main lemon grass oil market and for its derivatives Indian production is 500-1000 tonnes a year. The United States imports about 4 (1956) to 12 tonnes (1988) for lemon grass oil from India. Other markets for Indian lemon grass oil are the U.K. and few European countries. Indian oil has traditionally been known as "East Indian" or "Cochin" lemon grass oil. Chochin is the name derived from the main producing area. There has been two grades with 75% and 80% of citral. Indian oil had occasinally earned the reputation of rather lower citral content than the oil from Guatamala. It has been observed that the Indian lemon grass oil suffers from occasional substandard consignments exhibiting lower average citral content and has slightly burnt 'odour'. But of late India lemon grass oil has improved its quality tremendously. Cochin lemongrass oil fetched 8.25 cif London (May 1990).

Guatemala produces and exports an average of 250 tonnes from its 600 tonns/annum in the 60's is a main lemongrass oil supplier to world markets. Unlike India, Guatamala has an insignificant

domestic market for the oil. It has no special Trading arrangement like India. Guatamala exports have declined due to inroad of food crops which are increasing at the expense of cash crops. Guatamala has been a traditional supplier of "West Indian" type of lemon grass oil. It possess a higher citral content. Guatamala lemon grass oil has a large of citral of 75% - 80% of citral. Guatamala high eitral content is due to careful processing.It has a consistent reputation for good, even quality which has ensured continued popularity. However, some see in Guatamala lemon grass oil a high percentage of methyl - heptanone as an disadvantage in certain circumstances. The main market is the USA which airports between 50-67 tonnes annually valuing from US $ 300,000- 600,000. The other markets are in the U.K. and France. Guatamala oil fetched to 8.25 per kg cif London in May, 1990.

The Peoples Republic of China is another major producer, and although production statistics are not available, recent Chinese exports have averaged between 60-80 tonns a year. No export trends are discerbable. The chinese lemon grass has a 80% citral content. The main markets are the U.S.A. and Japan. The U.S.A. import between 4 - 11 Tonnes of oil annually valuing US $ 300,000-800,000. China is the

sole supplier of Litesea cubeba oil which is a rival to lemon grass oil, particularly to extract derivatives.Production of this oil is labour intensive. A large labour face is required to collect the fruit which has oil bearing seeds. The Four Modernizations in China may have their influence on the supply situation of the oil and create a market for lemon grass oil. Anyaway Chinese supplies are subject to uncertainity. Citral content of Chinese litsea cubeba oil is 75%.

Sri Lanka is not an large exporter. It exports on an average 4 tonnes annually mainly to the U.K. and the U.S.A.. In 1986 2 tonnes and in 1987/88 3 tonnes were imported into theU.S.A. Sri Lankan lemon grass oil is of the East Indian (Cochin)type. The industry is in the hands of the private sector. Brazil is yet another lemon grass oil producer which exports a small quantity whilst absorbing large quantities into its broad demostic market especially bytheBrazilian expanding perfumery industry. Its average exports is around 2 tonnes.

Argentine is yet another exporter which exports around 4 tonnes mainly to theU.S.A. Major part of its oil is used for the extraction of citral in the domestic market. Other small producers are Haiti, Indonesia, Thailand, parts of Africa, Indian Ocean Islands, Mexico (2-3 Tonnes/Year),

El Salvador (4-5 Tonnes/Year), Colimbia, Paraguay (1 Ton/Year), Taiwan, Iraq and Dominica (1 Ton/Year). Re exporters of Lemon grass oil are France, Switzerland, the U.S.A., Australia and Netherlands.

Bulk of the consumption of internationally traded lemon grass oil takes place in four main areas:

(A) Western Europe	- 130 - 160	tonns/annually.	
U.K.	- 60 - 70	tonnes mainly from Guatamala, India, Sri-Lanka.	
France	- 35 - 40	tonnes mainly from Guatamala	
FRG	- 10 - 12	tonnes mainly from India	
Netherlands	- 10 -	Tonnes mainly from Peoples Republic of China.	
Switzerland	- 10 -	tonnes mainly from India.	
(B) Northe America	- 100 - 110	tonnes / annually	
U.S.A.	- 80 - 100	tonnes mainly from Guatamala, India and China.	
(C) Soviet Union	- 100	tonnes/annually mainly from India	
(D) Japan	- 35	tonnes/annually mainly from Guatamala and China.	

Lemon grass is known in Pemba. The distillery at PEmba can easily distill lemon grass oil. The crop grows well in the island. The Chinese production plans are somewhat unpredictable and many buyers

feel uncertain regarding the Indian and Guatamalan suppliers. Thus, a country like Zanzibar should take this crop in the short run and distill oil for exports as a diversifying strategy to maximize capacity of the Chake Chake distillery.

VETIVER OIL

Vetiver is known in Zanzibar as Mzumari or khus khus grass. The cultivars developed are those locally available and oil yields of 0.8% have been reported. The new hybrid varieties suited to dry/standy areas developed in India namely Hybrid F and NC 66404 by the National Bureau of Plant Genetic Resources, Pusa Campus New Delhi may be introduced into Pemba. The wild roots give 0.3 - 0.4% of oil, cultivated wild varieties yields 0.8 - 0.9% of oil. CIMAP of India has introduced two high yielding strains.

(a) KS - 1 selection from Bharatupur;

(b) KS - 2 selection from Bharatpur and Moosa Nagar. Another tetraploid strain called "Sugandha" contains 1.4% oil compared to wild strains which gives only 0.4-0.5% oil.

The advantage of this cultivars is that there is an improved tetraploid strain which is called sugandha giving better root biomass and increase in oil content (1.4% oil). This new cultivar require less water. Similar varieties could be introduced to Zanzibar from Reunion, Indonesia and Haiti. The

Vetiver oil is now selling at US $ 45 per Kg cif London (Indonesia). It was US $ 33.50 kg (Chinese), US$ 24.00 per kg (Haiti) US $ 50.50 per kg (Java) in July, 1989. Vetiveryl acetate was priced at US $ 160.50% per kg. The Zanzibarian oil is colourless and has woody, earthy and slightly babamic aroma. An analysis of the oil done by Dr. Mohan L. Maheswari (March 1990) from the National Burgae of Plant Genetic Resources, Pusa campus, New Delhi, India, reveals "the oil is quite similar to oils from Haiti, Reunion islands andIndia (cultivated type)".

There are several advantages in developing Vetiver as an economic crop in Pemba.

(1)) It is a good raw material for the use at the Pemba, Chake Chake oil distillery;

(2) It is an erosion preventing crop suitable for an island like Pemba subject to high erosion in the rolling terrases;

(3) It is a long lived perennial; Zanzibar variety yields in 9 months to 1 year compared to Indian variety taking 1 - 1½ years.

(4) Its root system is deep and strongly fibrous;

(5) Its seeds are sterile, hence grows only where planted;

(6) It is not eaten by cattle and other livestock.

(7) It can grow to a dense hedge which can filter sedimented surface run off;

(8) It is not attacked by pests and diseases;

(9) It is extreamely hardy and can withstand moisture stress for long periods.

(10) It can withstands total drought and total inundation;

(11) It does not become a weed.

(12) It is a good firebread;

(13) Vetiver roots are ideal for steam distillation at the Chake Chake distillery, taking 10-15 hours per charge;

(14) Vetiver oil is one of the perfumers most basic traditional material, possessing fixtive properties, with an aroma basically woody earth charcter, pleasant and extremely persistent, and is difficult to reproduce with systematic aroma chemical formulations.Therefore, the oil is used in fine perfumery and in a whole range of soaps, skin lotions, deodarants and other cosmetic applications. It is used in fine perfumery and in a whole range of soaps, skin lotion deodrants and other cosmetic applications. It is occasionally used in fragrance but more often used to provide a solid foundation upon which other fragrance notes are superimposed. It is used occasionally in asparagus type flavours. In India it is used as a subsititute to sandlewood oil in the agrabathi industry and as a strting raw material for vetiverol and vetivery l acetate useful in

fragrance industry. Vetiver oil is usually used unprocessed. Now to use it in one or other of its derivatives- the alcohol vetiverol is one of its principal components and is used as a preferential ingriedient after isolation from the oil. Thus, vetiver is used as an intermediate in the production of vetiveryl acetate. The acetylation process by which the compound is produced can be also applied to the whole oil rather than merely to one of its alcohols(Vetiverol)and then acetylated oil is known simply as vetiver acetate. Both vetiverol and the two acetates have softer odours than the basic oil and are used in higher class, more expensive products and as would be expected they are more expensive than the oil as such. The preparation of this oil deviratives involves fairly intricate operations and is therefore, undertaken mainly in importing countries and even individual firms intending to use the derivatives.

A part from these derivatives it is possible to refine or reprocess the whole oil in order to improve its odour and some firms especially in France carry out this type of operations. Terpenless vetiver oils, however are virtually never produced.

The main sources of vetiver oil is nowadays are Haiti, Indonesia(Java), China, Angola, Reunion, Brazil, India, Guatamala. Occasional oil supplies

come from Indian Ocean and Central and South American countries but seldom or never in sizeable or sustained quantities. All available trade statistics suggests that the world production is in the order of 300 tonnes and world export market is around 235-265 tonnes, which means nearly 95% of the vetiver oils are exported. The main producers are Haiti and Indonesia (Java) each of which supplies around 100 tonnes annually to the world market. The Haitian oil has a reputation for consistent quality and has a slightly higher vetiverol content than for Indonesian oil.

Haiti - Vetiver oil from Haiti is generally regarded as the best of the large volume vetiver oils. This oil is not quite good as the Bourbon oil produced by Reunion. At present it enjoys a dominant position in the world market. Annual production is recokon to be 100 tonnes and all of it is exported. Its vetiverol content is in the region of 53.54% which although not as high as that associated with the oil from Reunion is high enough to command it strongly to perfumers throughout the Western industialized countries. Haitian oil is frequently used as an oil in its own right. It is extremely suitable according to users for the production of vetiver acetate or vetiveryl acetate and occasionally of vetiverol for use in its own right. The quality of the oil tends to be more consistant than does the quality of oils from some other sources and it tends to be used in rather more

extensive intermediate products than do say Indonesian or those from China.

The marketing structure in Haiti is centralized and therefore, the bulk of the oil is handled by a number of very limited number of dealers and agents in importing countries. This has not been advantageous to the Haitian vativer oil trade. Recent trends have slackened in the market due to four factors.

(a) Periodic communication problems;

(b) High officially fixed price levels;

(c) Lapses in the standard trading procedures;

(d) Occasional tendency for consignment not matching the corresponding samples.

Therefore, users have been diversifying away from Haitian oil. Simultanzeously, there has been a shortage of Indonesian vetiver oil and Haiti has been stockpiling its oil, in order to increase prices but with the release of stocks prices fell sharply. Therefore, the perfumers are questioning the over dependence on vetiver oil as a basic perfumery material unless a new supplier like Zanzibar could maintain regular supplies and build a reputation with the trade. After the recent political problems in Haiti communication problems relating to trade seems to have eased somewhat, making Haiti oil prices to be more flexible than it has been in the past.

Indonesia - Vetiver oil is produced in the Java island where the production is long established and exports have averaged 100 tonnes per annum, placing it alongside theHaitian oils in terms of the importance in trade. The Haitian political and marketing problems has worked to the advantage of the Indonesian producers and the demand for Indonesian oil has increased. Indonesian oil is reported for its variable quality than it has been the case with the Haitian oil. The amount of care taken over the distillation process depends very much on the ruling prices and there has been very substantial price fluctuations. The problem are:

(a) burnt odour

(b) low vetiverol content

(c) High acidity

(d) Presence of foreign matter and contaminants

The shipment procedure straight from producing country to destination rather than the via Singapore is now the practice. The quality of vetiver oil is reported to have deteorated prior to 1982, vetiver content being as low at 47-48% andacid numbers high. This has resulted from the cash problems for the producers caused by rising costs in conjunction with sometimes uneconomic world prices and therefore, they appear to have resorted to premature harvesting and take less care during processing than in the past. The Indonesian

oil does not enjoy the same reputation as the Haitian oil. Nevertheless, it is widely used, both in its own right and as a strating material for the preparation of isolates and derivatives. Both the oil and its derivaties are used in a range of products similar to those applicable to the Haitian oil although at the cheaper end of the market. Sometimes it is blended with Haitian oil but it is regarded not a true substitute for it. Its increasing popularity has been noticeable in the US market and the French market. continuous level of production in Indonesia depends on long term market prices which with the release of Haitian stockpile reduced the prices and discouraged the Indonesian from planting at all. By 1981 end the prices have recovered and the outlook was more promising.

Reunion The oil distilled in reunion is widely known by the appelation "Bourbon". The Bourbon vetiver oil is traditionally the world's best on account bothe of its odour and its vetiverol levels are frequently in excess of 60%. Production levels have always been limited and prices have been substantially higher than vetiver oils from Haiti. There has been an element of official fixing of the price. Recent years has shown a decrease in Bourbon oil production due to:

(a) users are increasingly unwilling to pay the high price;

(b) ageing equipment;

(c) need for economics in the production process due to rising labour costs.

Therefore, the quality of the oils decreased significantly. However, even if the quality of the oil is godd, yet increasing sophisticated blending and modification techniques have reduced the need for oil of the very highest quality. The current average production is around 17.25 tonnes per year. The main market for the oil is France.

People's Republic of China

Imports from this source was recorded intermitterly through the 1970's. The current production levels has been 20-30 tonnes per year. Nearly 75% of the production is exported. chinese vetiver oil does not find with much favour in Western users. Oil from the Kwantung Province is better than those originating from the Shanghai Province, due to the factoors.

(a) its acid content tends to be low:

(b) Potential yields of the derived acetates is low.

Prices of oil is relatively low. It fetches about US $ 33.50 kg . (July 1989) The Indonesian oil and Haitian oil fetches higher prices. Im May 1990 Indonesian oil fetched US $ 45.30 per kg. Chinese oil has a limited market mainly for blending purposes and for the isolation of vetiver acetate in spite of the low yields. Chinese oil is used in low cost formulations. Demand for Chinese oil is low compared to what is being exported. It market is specially in

the U.S.A. , Japan and the U.K.

Brazil

There is a steady commercial operation in Brazil. Total production is estimated to vary. The quality is better than the Chinese oil and competes with that of the Indonesian oil. Major market for the oil is within Brazil where there is a growing market for cosmetics. Roughly around 10 tonnes peaches the export market annually. It is mainly used for blending and for extracting vetiver acetate and vetiverly acetate. It tends to be comparatively expensive oil. Its odour is generally regarded as moderately good. There is relatively little interest in it and markets would be in Brazil and Latin America .

Angola - United 1970 Angola was a regular supplier and prices were regularly quoted. Since the civil war supplier have dwindled to zero and have not shown any signs of recovery. The Angola oil had a regular following among users though at times it tended to be dark and viscous.

Zaire - Supplier of oil declined by early 1970's. Production was undertaken on a regular basis under Belgium management until operations closed down. There seems be no signs of revival.

India - The oil is widely known now. Production is very intermittent and on a very small scale. Trade continues. Quality of oil is indifferent, prices tend to be too high for production of either of the derived acetate to be economic.

Guatamala - Production was existing form early 70's. The average export was 5 tonnes. The production declined to zero and there is no signs of revival.

Malaysia - Local market absorb the production and due to high labour cost it has declined.

S. Africa- There is a small vetiver oil production. Although the quality is high and close to Bourbon oil, no serious attempt is made to increase production.

Other Countries-

Some countries in Asia, Indian Ocean islands produces small quantities. Martinique produces vitiver oils to the French market. Some attempts are being made in Egypt to produce Bourbon oil.

The largest markets for vetiver oil are the United States, which imports on an average 85-95 tonnes annually with a market value of US$ 46-62 million. The main source are Haiti, Indonesia, France, Brazil, PRC. The demand since 1970 has been as follows:- (Table VIII)

Table VIII

Year	Quantity (Tonnes)	Value US $ millions
1970	79	1.68
1972	90	1.90
1974	96	5.61
1976	112	5.8
1978	154	10.3
1980	115	4.6
1986	78.3	3.64
1987	77.5	3.61
1988	98.78	5.95

Source: US Department of Commerce

Source of Supplies

Source	Quantity(tonnes) 1986	1987	1988	Value US $ millions 1986	1987	1988
Haiti	56.92	57.31	67.49	2.74	2.70	4.3
Indonesia	11.8	14.30	10.866	0.34	0.46	0.52
France	5.17	4.89	6.69	0.48	0.37	0.55
Brazil	-	-	4.60	-	-	0.20
PRC	4.0	-	2.60	0.09	-	0.08
Hong Kong	-	0.50	2.00	-	0.01	0.06
French Indian Ocean Areas	0.3	0.1	1.25	0.03	0.009	0.148
Switzerland	0.13	0.06	0.16	0.06	0.03	0.01
Japan	-	-	0.05	-	-	0.02
India	-	0.3	-	-	0.05	-
FRE	-	0.04	-	-	0.20	-

Source: US Department of Commerce

There is re export market from New York of around 15 tonnes per annum. The current demand is 98.100 tonnes per year. Some users blend Haiti and Indonesian oils. Indonesian oil is destined for the cheaper end of the market. Both Haiti and Indonesian oils are used per se unprocessed for the less expensive applications. The use of bourbon oil in the U.S.A. has been slow declining though preference is for high class perfumes. Chinese oil is disliked. Brazilian oil has a slow but a declining demand. Vetiver oil is widely used in the u.S.A. from large soap manufacturers to small firms who manufacture perfum handkerchiefs.

In the US market complete vetiver oil is not available. There is comeptition from cedarwood oil and its dervative cedrol acetate.New York dealers handle Indian oil. Haitian oil is handled by one or two dealers. With the right quality and right price the intrusion into US markets using New York traders would be a good strategy for Zanzibar. It is important that regularity of supplier is vital to get the trade interested.

The United Kingdom market absorbs about 21-25 tonnes a year. Import are consumed domestically. There are at times re exports. The main sources of suppliers are Indonesia and France. French oil is of high quality rectified oil fetching high values. Haiti is a minor but important exporter and are despatched from dealers/ brokers in New York. Chinese oil are regularly imported and there is a high dependence on the oil. In this market Haiti oil is prefered to Indian oil except for the supply problem. Bourbon oil is highly regarded in the market,but demand for this type of oil decreased due to high prices. However, the demand for oil of the Chinese origin is steady.

Supply Sources

Indonesia	- 6 - 7 Tonnes
Singapore	- 1 - 2 Tonnes
FRC	- 2 - 4 Tonnes
Reunion	- 1 Tonne
Brazil	- 1 Tonne
U.S.A.	- 1 - 3 Tonnes
France	- 7 - 9 Tonnes
India	- 2 Tonne
Others	- 1 - 2 Tonnes

Source: U.K.Trade Statistics

In the U.K. vetiver oil is used both in its own right and in the form of its derivatives like vetiver acetate. There is a greater interchangeability re production of derivatives are involved. Bourbon and Haitian oil is used in expensive application. The U.K. usage of vetiver oil and its derivatives is fairly typical of the world wide pattern. It is mainly used to provide a woody type basic note int the whole range of fragrance for cosmetic products, soaps, aerosols, and even household. The usage of oils in fragrances is insignificant. Even though extenders are available in the market with synthetic origin, and are in use, yet the consumptio of this oil has not decreased. Many firms in the trade handle vetiver oils.Some larger consumer are directly purchasing from reliable producers. If the sole agent of the ZSTC in the U.K. who looks after its interest in EEC could be requested to look after the market, it would be a good strategy.

France is a major importer of vetiver oil and is in par with the U.S.A. 50% of the oil is re exported unprocessed, redistilled or refined. The annual consumption of the oil by the French perfumery industry in 50 tonnes and the trend is on the increasing demand for the oil .The French show a great interest in Bourborn oil from Reunion and it is used in high class perfumes. Haitian

oil is great is volume use. Indian oil is only 25-30% of the Haitian supply. Brazilian and Chinese oils are well known in France, and is used regularly. There is a likelihood of French using cheaper starting materials where possible, which could influence the demand. There is also a trend towards an increase use of extenders. There is not much competition from synthetics and with a French conservative perfumery industry there is unlikely to be any significant decline in demand for the oil.

The trade is handled by dealers and brokers. There are big firms at Marselles and Bordeaux handling major imports and lesser extent in Paris. They also handle buld of the reexports.

Federal Republic of Germany is a minor consumer and under re exports. There is a proportionately greater level of imports of ready made perfume compounds in Federal Republic of Germany and thereby increasing demand. With the reunification of the DM recently and opening of Eastern and Western Germany, the rising standard of living in the future, the annual imports of 6- 7 Tonnes would increase.

French bourbon oil and Haitian oil is highly regarded. Indonesian oils have unenthusiastic interest and is used for cheaper source of vetiver acetate. Chinese oil is known and there is little interest in them. So far, the Brazilian oil is used in soap

fragrances minor lotions and deodorants and in a wide range of general prefume application. Consumption is stable and is expected to remain so. The integration of the Western and East Germany is expected to increase the demand in the long run. Trade is through the dealers in Hamburg and Bremen. However, some perfumery and compounding houses imports their requirements directly.

Netherlands

The average imports is in the region of 5 tonnes per annum. The major suppliers are the U.S.A. , France and Indonesia. It is said that there may be imports incorporating the oil and in perfume compunds. The use is restricted to one or two largeprocessing and compounding firms with international connection. The Netherland uses whatever vetiver oil as good general purpose oil It has no threats from Synthetics. There is little influence form fashion movements. Trends are similar to other countries. The uses are in the upper end of the market. There are direct contact by buyers with suppliers. Amersterdam and Rotterdam dealers handle small quantities of oil.

Switzerland

In this market one or two processing forms which produces a wide range of perfumes and flavour compunds.

The annual imports is 30 tonnes. The Indian oil is commonly used in Switzerland where it controls 2/3 market share whereas Haitian and the RPC oils have 1/3 of the market share. PRC exports about 5 tonnes annually to this market Bourbon oil is used only in small quantities. Oils from other sources are rarely purchased. The Chinese oil is normally blended with Indonesian oils beforeuse. The pattern of usage is similar to other areas. Most of the vetiver oil is acetylated before use and an adequate vetiveral content and good odour are important criteria for the buyer. High acid content is no problem for the extraction of derivatives rather than used direct. The level of usage is fairly steady. The vetiver oil is considered relatively fashion oriented. Oil is purchased directly from the producers whereas Haitian oil is imported from dealers/brokers in New York.

Japan The market takes about 8-15 tonnes annually. All imports are internally used. The sources of oil are:-

France	- 6 - 7	Tonnes
Indonesia	- 1 - 6	Tonnes
Haiti	- 1	Ton
U.S.A.	- 1	Ton
Others	- 1	Ton

Other Markets - The North Western Europe (other than the U.K. France, Netherlands, FRC and Switzerland), the Eastern Europe and the LAtin America together uses 30 - 40 tonnes annually. The major supplies is France and the trend in this markets are increase.

The trading structure and procedures in producing countries reveals a greater private sector participation in India, centralized system in Haiti and the Peoples Republic of China, and small scale production among other.

It is recommended that vetiver grass be encouraged both as a commercial crop as well as an erosion preventing crop. The scale of plantation should be modelled with the distillery having its own nucelus plantation with contracted outgrowers. This crop should be given priority and is a suitable crop is the short run. It should be a source of diversification for the optimization of the capacity utilization of the Chake Chake distillery.

4.7: CITRONELLA OIL

This oil ranks slongside with the Lemon grass oil and is one of the widely used of all natural essential oils. It owes its traditional popularity to its combined vartues of cheapness and pleasant fresh fragrance. Thus, it is suitable for use in a

whole large of everyday household and industrial products. The citronella plant was first commercially exploited in Sri Lanka. Now it is cultivated in Asia and the Central ans South America.There are two basic types of citronella oil which are closely related but with distinct chemical characteristics.

(A) Java type citronella oil from the grass Cymbopogon winterianui Jowett. This type is produced virtually in all countries.

(B) Ceylon type citronella oil from the grass Cymbopogon nardus Rendle. This is exclusively distilled in the southern part of the Sri Lanka (Hambantota District where citronalla grass is grown as a mono crop and as intercrop in coconut) Indian new cultivars of citronella oil are reported namely Manjusha variety and the Mandakini variety. Citronella oil is used in their own right in perfumery applications. The Java type is an important source of number of isolates many of which are important in the perfumery fields. Nearly 85% are acetylation (expressed as the predominant alcohol geraniol). Within this 35% are carbonyl compounds expressed as the aldehyde (Citronellal.Java type is frequently specified as "85%/35% oil in reference to their generiol and citronellal contents. 15% attibutable to a group of chemicals known as terpenes. From citronellol citronellol and hydocitronellal are extracted from hydroxy citronellal is possible to manufacture e-menthol.

The Ceylon type are used mainly per se as is so that case with the Java type. Citronella oil is used in toilet soaps, cheap household soaps, detergents, household and industrial polishes, clearing compounds, aerosols, both preparations etc. If fresh fragrance incorporated into many otherwise unpleasent smelling products in order to mark the undesirable odours of certain active ingredients. Its usage in food indistry is virtually nill. it is used in a minor form in one or two animal feed compounds as a minor flavour agent. Isolates of citronella oil have comparatively few uses in its own right but it is used to impart a fesh lemon like odour to soaps and detergents and it possess the virtue of chemical stability in these applications. Geranoil and its derivative citronellol both possess fragrances reminiscent of rose and are known as rose alcohols. They have extensive use in perfumery products, both preparations and many other applications. Derivations of cintronellol includes esters such as the formate and acetate. Formate has applications in floral compositions of the rose and lily of the valley type. From geraniol and citronellol such derivatives like nerol, laveo-citronellol and others can be produced for use in perfumery. 2 menthol can be made from dydroxycitronellol but due to the cost of processing cheaper substitutes are used. There are few uses for citronellol oil terpenes. They are incorporated

into low grade products and artificial essential oils. The Ceylon type contains much lower proportions of geraniol and citronellol and is seldom used for extraction. The geraniol content varies between 50 - 60% according to the grade of the oil. The citronellol content is 15%.

The recent trends in the industry is to move away from cheap oils like citronella oil but use in certain type of products like large block household soaps. Manufacturers in Spain and Italy still uses citronella fragrances.

The decline in the world citronella demand have been due to seven major factors:

(a) In the extraction of isolates;

(b) Severe competition from turpentines containing large quantities of the pinene chemicles;

(c) Terpentine contains greater quantities of and pinene and presents more problems as a sterling material;

(d) Synthetic isolates are cheaper in relation to counterparts produced from natural citronella oil;

(e) Competitive prices ,and the rising cost of production at sources of supply;

(f) Competition from Eucalyptus citriodora, which is used as a source of gydroxycitronellol, which is cheaper than citronella oil;

(g) Preference for hydroxycitronollel from E cit.

Preference for citronella oil is the preference of the perfumers for the olfactory and even technical properties of some devivatives of natural origin vis- a vis their synthetic competitors. Terpentine by products of kraft sulphate process of paper pulp manufacture is also available to complete with citronella oil. However, citronella oil has the advantage of oil being a convenient source of income and is harvestable in a few months after planting. The only disadvantage is severe price fluctuation.The world production is difficult to estimate due to scarcity of data on production in countries like China, Brazil and Argentina. The producers and exporters have large domestic market. An estimate on the size of the world trade is around 2000- 2500 tonnes per annum. 40 - 50% of the supplies originate in Indonesia , 5% from Sri Lanka, China, Taiwan, Guatamala and 2% from Brazil. Other producers are Vietnam, Thailand, India, Mexico, Honduras and South Africa. The world prices for citronella oil; Sri Lanka (ord) US$ 6.80 - $ 6.40 per kg, Java (spot) US$ 4.30 - 4.20 (cif). China (spot) US$ 4.60 - 4.30 (cif) per kg. (May 1990) Citronelyl was US$ 17.40 per kg.

Sri Lanka - bothe types of a citronella is produced. The average exports has been 120 tonnes (1977-1980) per annum. Sri Lanka has a large domestic

market for the oil. The major markets are in the U.S.A. (0.02-0.04) tonnes), the U.K. and France. Switzerland imports small quantities. New Zealand offers an important but a small market . Sri Lankan cintronella oil are used in citronella candles which are used as mosquite repellants. Sri Lanka type of citronella can be grown in poorer drier soils than Java type. The oils are produced in three grades-

"Common" quality - minimum 50% geraniol

"Ordinary" quality-minimum 52% geraniol

"Estate" quality - minimum 55% geraniol

Price differential among them are small.

Indonesia (Java) The oil faces competition form China. Indonesia produces about 1000 tonnes of citronella oil but exports 730 tonnes (1978-1980). The supplies to the world markets of Java type has declined due to three factors (a) citronella oil is now processed into Gerenoil and citronellal in Indonesia before exports as an added value product fetching a good price.

(b)Production decline due to low prices

(c) Increased cost of production.

The markets for Indonesian oil is in the U.S.A., North West Europe (Netherlands), and Japan. Taiwan imports and reprocess Java citronella oil. The Java Citronella oil are sold on specifications than by samples i.e. "85/35" basis as for percentage

of constituents expressed as geraniol and citronellal. "99/90" oils can be distilled from new cultivars.

If citronella oil is of high standard, cleanliness purity and with 90% and 40% respectively of constituence viability to acetylation expressed as geraniol, -carbonyl compounds expressed as citronellal, there is a good chance to be in the market. The oil needs to be free from adultration from keresone, tarpentine and even vegetable oils.

People'sRepublic of China. - is the largest producer of citronella oil second only to Indonesia as an exporter. China has a substantial internal market for the oil. The cultivars are of the Java type yield Java type oil sold as 85/35% space inclean, good packaging widely like by dealers and perfumers. In the 1970's export was around 1000 tonnes but in 1980's it dwindled to 800 tonnes per annum. China extracts geraniol and citronellal from citronella oil for the export markets.

Brazil only sells residual citronella turpenes and the volume is unknown. There is a substantial domestic consumption. Exports are said to be around 16 tonnes.

Other producers are Vietnam , Thailand (for local soap/mosquito coil market), India (local consumpation, Java type) , S. Africa (Java type)

Argentina (Java type local consumpation). Handuras (local consumption), Mexico(local consumption) and Hongkong (transhipments)

The major market are the U.S.A. , the U.K., France, FRG , Spain,Italy, Belgium, Eastern Europe including the USSR, S. Africa, Netherlands, Switzerland, Japan and Mexicao. Their apparent consumption and main suppliers are given below:-

USA - 560 - 706 Tonnes - Mainly a market for citronella derivates than oil Sri Lanka type is preferred.

Competition form terpentine based synthetics and from Eucaucalyptus citriodora. Guatamala, is the largest supplier. Prospects are rather slow.

U.K. - 100 - 110 Tonnes - Sri Lanka oil important in low cost applications. main suppliers Chine, India, Taiwan, Vietnam, Brazil andGuatamala. Prospects low.

France - 140 Tonne - Re exports to Eastern Europe , North West Europe, and Java type of oil, Main suppliers Taiwan, Argentina, Sri Lanka and Vietnam. Outlook constant.

FRG - 100 Tonnes - Sri Lankan oil well known. Slow growth in the markets.

Spain, Italy, Belgium - 85 - 90 Tonnes. Prospects are good.

East Europe/USSR - 80 - 100 tonnes . Prospects are good.

Austrialia - 5 tonnes . Agrowing market

S. Africa - 10 tonnes. Some growth in the market

Netherlands - 150 Tonnes.Main supplier Indonesia, prospects slow.

Switzerland - 100 tonnes. Preference for Indonisian oil. Prospects stable.

Others - Japan - 190 tonnes

Maxico- 130 tonnes.

Compared to eucalyptus cetriodora, citronella oil prices are declining. The crop is easy to grow , simple to manufacture and harvesting is easy. This essential oil crop can be introduced in the coral rag areas of Pemba and would be a good raw material to distill citronella oil to produce citronella derivatives for exports. The crop is easy to grow. Its harvest is easy. It would find a good local market as Tanzania Mainland, Kenya, Uganda , Zambia and derivatives could be exported. Since Zanzibar ZSTC is interested in barter trade, the oil could be exported to the USSR, Eastern Europe , Spain, Italy or Belgium in exchange for sugar, flour, fertilizer or other imported products. This crop, thus, is recommended for the marginal lands in Pemba. It could be considered for the development in the short term.

4.8: GERANIUM OIL

Geranium oil is steam distilled from the green herbage of any of the several members of the genus Pelargonium, notably varieties of P. graveolena and P. radula. it is a good crop to be developed as a rainfed crop in the hilly areas of PEmba. The precise characteristics of the oil depend to a large degree on local climate and soil characteristics. It is one of the most important of the oils employed in perfumery formulations and is rarely,if ever, used as a flavouring.Its characteristic rosy odour is due primarily to geraniol and citronellol, oftern known as the "rose alcochols" but in the case of the geranium oil collectively known as the "rhodinol faction". This odour renders the oil very suitable for a wide range of high-grade perfumery products including toilet waters. Two other geranium products are used in perfumery marked in small quantities which are derived through solvent extraction process, namely , concrete and absolute. Geranium oils are used in less expensive items such as soaps, talcum powders, hand creams etc. In low cost and utility products it is now much were usual to employe the cheaper, synthetic citronellol and geraniol derived from turpentine via alpha-pinene and beta-pinene, whereever a rose effect is required.

Most perfumers agree that these synthetics are incapable of reproducing the total effect of geranium oil, which is therefore practically unchallanged at the upper end of the market. It is used in some per se. in others the rhodinal fraction is extracted for blending.

The world production of geranium oil is around 200- 400 tonnes per annum. Some oils are used within country's at source, notably in China and USSR and therefore the world production should be much higher. The main producers are Reunion producing 500 - 100 tonnes annually, whose annual output declined due to high labour cost and changing local actitude to the cultivation of essential oil crops. Morocco, Algeria, Egupt, China are other producers with Morocco and Algeria producing 10 - 20 tonnes annually and Eygpt 100 tonnes annually (declined to 20 - 40 tonnes annually due to crop losses from diseases and price competition from China). The other suppliers of the oil are Comoros, Madagscar, Zaire, Kenya, Ivory coast, India, the USSR, Hungary, Yogoslavia, Spain, Haiti.. The world trade in geranium oil is little over 150- 200 tonnes per annum. For may years, Egypt held 40% of the market Reunion 35% and China 20% of the market.Since 1982 China has surpassed both Reunion and Egypt. France has absorbed 50 - 100 tonnes annually, the USA

nearly 50 - 100 tonnes. Rest of the supplies go to the EEC and Japan. The best quality geranium oil is obtained from Reunion and is called the Bourbon oil. Many perfumers regard Egypitian oil as being very close in quality to the Bourbon oil. The quality of the Chinese oil was considered is different when it first appeared in the market but has improved steadily, and until recently it had the advantage of being extreamely cheap. Recent climatic calamities resulted in short supplies and price increases of the Chinese oil. Yet it remains highly compititive especially with the Egypition oil. At present China is playing a dominant role in the market with reduced supplies form Reunion and Egypt. At present the Geranium oil prices are US $ 25.50 - 36.10 per kilo(cif London) (May 1990) compared to Egyption US $ 42.00 per kg. (July 1989). The world demand for geranium oil is stable. Occasional high prices gives concern to the majority of perfumers. The present level and growth would continue slowly.

Except for China, rest of the producers are private sector marketed through a comprehensive network of intermediaries of various types including import merchants, dealers, commission agents, brokers, and processing and compounding houses. Trading is done on the basis of samples and payment on the basis of cash on delivery(c.a.d.) or letter

of credit. The general packaging is in 45 gallon (200 litre) metal drums. The oil yield is 0.10 - 0.15% and each charge take 4 hours for distillation and herbage has to be distilled within 48 hours. For a half ton batch charge capacity operating at near optimal capacity would require 7 - 15 ha. The plant suits Pemba and can withstand droughts. Rainfall during the harvesting season is not desirable. It adapts to most soils, light, fertile types are preferred Green mulch and distillation refuse could improve the soils. Propagation is through shoot cuttings. Planting is done in well prepared soils in April at a spacing of 30 cm x 1 meter 60 cm x 1 making it possible to have 25,000 plants per ha. Plants are harvested when it comes into bloom and on a dry day manually. Little volatile oil is present in the stem. The first harvest is possible in 6 - 8 months after planting. In the second year two harvests are possible in April, June and October, - November . The economic life of the plant is 3 - 5 years. Yields of fresh/green herbage average 0.1 % (w/w)

Year	Cuts	Fresh Green Plants Tonnes/Ha)	Oil Yield/kg/Ha
1	1	10	10
2	2	30-35	30-35
3	2	30	20

Roughly a ½ ton leaf charge capacity with a distillation time of 2 - 2½ hours would make 4-8 distillation in 24 hours/day. On this basis 50 days will be required during harvesting season. A minimum of 7 - 15 Ha would be an economic proposition.

This crop would give good results at prevailing prices. It is best the crop be considered as a meduum term crop to be taken up in one or two years in a plantation of the distillery. It is not recommended for immediate short term commitment.

4.9: CINNAMON LEAF AND BARK OIL

Wild cinnamon know locally as Mdalasini is popular in the country used in pilau rice and used also with tea. Peeled bark is sold in the local market at Tsh 400 - 800 per kilo. Although cinnamon has been grown for many years in clove areas of Unguja and more in Pemba it has never been commercially developed. The cinnamon in both Zanzibar and Pemba are free from any serious pests and diseases. The growth is vigorous. The potential for cinnamon in Pemba is high. The crop can be harvested in two years.

Cinnamon leaf and bark is obtained from Cinnamomum species, Cinnamomun verum (syn. c. zeylanicum). C. Zeylanicum is grown in Sri Lanka, Seychelles, Madagascar. C. ob tusifolium , C. tamala, C. sintok is grown in India. C. Cassia, C. loureriі, c.burmanni is known as cassis of commerce. Chinese commerce in

mainly from China, the Saigon Cassia (C. LOUREIM) is grown in Vietnam, the Indonesian cassia (C. Burmannis) is grown in Indonesia. C. Camphora known as camphor tree is found in Japan, China and Taiwan (Dr. R.O.B. Wijesekera and U.M. Senanayake . The Volatiles of cinnamomun species - 11th International conference of Essential oils, Fragrance and Flavours, Nov.1989 New Delhi, India).

Cinnamon is the dried inner stem bark of several cinnamon species largely cultivated in South East Asia , South Asia. the highest quality cinnamon is obtained from c.zeylanicum grown in Sri Lanka. Some species is known to grow in India, Seychelles, Ghana and Malagasy Republic. It has been introduced to may tropical countries judged to have similar climatic conditions but no cinnamon of signifcnt quantity has been produced from these areas. Cinnamon in Sri Lanka shows qualitative variations within Sri Lanka. The dried bark produces quills, quilling, chips, feathering, powder, oils. Leaves gives cinnamon leaf oil. Oleoresins of cinnamon are also made.

Sri Lanka cinnamon bark oil has cinnamic aldehyde content varying from 51% - 76% . The higher the c. aldehyde content,the higher the price and competes with synthetic cinnamon aldehyde taking advantage of this. Cinnamon leaf oil is produced in Sri Lanka, Seychelles, and Madagascar but the only reliable source is Sri Lanka. Generally, cinnamon leaf contains 1.2% stem volatile oil which can vary from 0.5 - 1.8% depending on the water content of the leaves and the method of distillation. The principal constituents of the leaf oil is Engenol (Varying from 65.98% % in leaves). Minor volatiles are beta - cary ophyllene linolool, safrole, cinnamic aldehyde, cinnamic acetate,coinanyl alchhol, benzyl benzoate. The stem bark oil yields vary from 0.4 - 0.8% and roots bark oil yields vary from 0.9 - 2.8% . The yield of oil vary on the basis on the distillation method, type of plant, age of the plant , water content of the material. Cinnamon leaf oil from Seychelles has 90% Engenol, Sri Lankan leaf pil 75-80% and the Madagascar 70-80%. Imported oil is rectified before sale to the end users in order to give cleaner product.

Cinnamon in ground iorm is used in bakery products. Cinnamon flavoured toast and droughnuts is popular in the USA. Cinnamon is used in meat seasoning, certain fruit preservatives in the Federal Republic of Germany;

as a fish spice in Japan , and Denmark and in spice mixes. In Japan and the USA 5% is used in curry powders. In France cinnamon sugar is used for culinary purposes, in flavouring beverages and in hot spiced wines. It is also used in phamaceutical compounds. Cinnamon oleovesins is used in flavouring products, bakery products and in deverts. Cinnamon bark oil is used in food flavouring and perfumery industiries for meat seasoning, barked goods, apple pies, fast food seasonings, sources, pickles, confectionary, cola type heverages, tobacco flavours, dental and pharmacentical applications, expensive perfumes. Cinnamon leaf oil closely resembles the clove leaf oil is respect of Engenol content. It is used as a source of Engenol, iso-engenol and is used in confectionery products, seasoning, savoury snacks, cheap fragrance for soaps and insecticides. It is blended with cinnamon bark oil also.

International trade in cinnamon spice is around 7500-10,000 tonnes per year. 80-90% is supplied from Sri Lanka, 10-20% Seychelles and Madagas. A very small quantity is supplied by Carribbeans. The market value is US $ 25 million. The main market are in Mexico, USA, Europe and LAtin America. Sri Lanka is the dominat producer and exporter with seychelles, Madagascar, India Nepal, Camaroos, Mayotte, Mauritius, Grenada, St. Vincent, Jamaica.

Cinnamon leaf oil distilled from cinnamomum verum leaves. Sri Lanka is the only produce, producing 90 - 114 Tonnes(1977-1983). Seychelles supplies have ceased. No cinnamon leaf oil is produced in Comoros and Madagascar, India exports a small quantity. The major markets are in the USA is in the range of 40 - 60 tonnes, where it is used in flavours, and fragrances. The oil competes with clove leaf oil. Demand for cinnamon leaf oil is steady and is increasing. The EEC market is important, the U.K. and France taking 20 tonnes, Federal Republic of Germany and Switzerland taking 5 tonnes and the Netherlands takes 2 tonnes. The demand is steady for cinnamon leaf oil in Europe.

Cinnomon bark oil is distilled from C. verum. Sri Lanka is the largest producers. Occasional supplies originate from Madagascar. Cinnamon bark oil is a high value essential oil and the volume traded is low. Sri Lanka exports 2 - 5 tonnes per year. The main markets are in the EEC where 80% of the Sri Lankan bark oil is sold manly to Italy, France, the U.K. , FRG, and the Netherlands each absoaping about 200 - 500 kg per annum. Switzerland take s about 200 kgs, Spain 100 kgs and the U.S.A. 60 kgs. Japan takes in around 60 kgs. The prices are high though a fall in price should lead to increase use it is not considered that the price elasticity of demand for the oil is such that a higher export volume

will not generate more revenue overall.

Cinnamon olearesins is traded only in small quantities , as small as 6 - 7 tonnes per annum. The USA is the major market and is used mainly in the bakery industry, desserts and confectionery. Growth for the product is very slow.

Prices for cinnamon vary according to quality. The prices in May 1990 for Seychelles cinnamon bark was US $ 17,000 cif per tonne. Cinnamon leaf oil was relatively stable between 1979/81 and increased after 1983. In 1984 prices stabilized at US$ 10 per kg(cif) UK compared to US$ 9.00 per kg in Feb. 1989 prices have been increasing. In May 1990 it stood at US$ 9.70 for Sri Lankan leaf oil in London compared to cassia oil which fetched US $ 38.20 - 41.30 per kg (London) . Cinnamon bark oil is an expensive oil than cassia oil. Prices are high and due to its high value and small package is normally airfreighted to destinations. The trade stucture in Sri Lanka in linkages from the producer, collector, dealer and exports. Cinnamon leaf and bark oil does not attract duty. Grenada exports through minor spice corporation and in Seychellers the sole exporter is the seychelles National Commodity company limited (SEYCOM) for bark and is seperate state company handles bark and leaf oils. Like in Sri LAnka, in Madagascar, cinnamon oils are exported by the private sector. Standard packaging for cinnamon

bales are 50 kg and for oils is 180-200 kgs lined steel drums.

The prospects for cinnamon as a spice is satisfactory. there is growth in major markets for cinnamon leaf oil and for the high priced cinnamon bark oil is also good. Cinnamon oleoresins faces competition form cassia oleoresins and from in expensive synthetic cinnamon flavours. However, there is room for reliable suppliers.

This crop should be taken up for commercial cultivation both for bark, quills, as a spice as well as for cinnamon leaf and bark oil, in Pemba. The crop produces several products and would serve the country in their diversification strategy. This like, lemon grass, vetiver oils should be in the high priority short term crop categories to mazimize capacity utilization of the Chake Chake distillery.

4.10: NUTMEG AND MACE OIL

The Nutmeg tree, Myristica fragrans, belonging to the familu of Myristi caceae, is grown in Kizimbani in Zanzibar and is well stited to be introduced into Pemba in the rolling terrain as a mixed garden crop and in the foresting programmes which should the expert believe take the form of agro-forestry and community foresting programme, growing crops like nutmeg, patchouli, genanium, ylang ylang as mixed crops along with fuel wood Indian almond, cassurina, possibly alstonia, albezia, eculyplies, Jerminali

Cadapa, T. eforeste, Elafilum, atogaspahar intergrapholia. The nutmeg and more could be exported as spices and also used as raw material at the distillery at Chake Chake to stam distill nutmeg and mace oil. Agronomically and capacity of distillery is concerned the crop would be ideal. There is also the knowledge of the crop with Kilimo.

The nutmeg tree produces two distinct spices, the nutmeg which is the seed of the plant and the mace which is the aril that sorrounds the seed. If product are of non-traded types and defective it would be iedal for oil distillation. The domestic consumption is negligible. Locally it is called kungumanga. Mace is called in swahili Basi basi.

The commercial products of the nutmeg tree are the nutmeg, mace, theri essential oils, extracted oleoresins and nutmeg butter. Nutmeg and MAce, the two basic products, account for the greater past of the trade. they are generally traded in the whole from and nutmegs may either be shelled or unshelled. Recently, some countries have exported small quantities of the ground spice. Nutmeg and mace oleoverins are obtained through the solvent extractions process and until recently were not produced in the countries of origin and even now production at source is very small. Nutmeg oil, on the other hand, is mainly produced at source. International trade in mace oil is negligible at present. Nutmeg

bother is prepared by expression of the fat from nutmeg but is still a very minor product. Only a very small quantity is exported.

The main sources of nutmeg and mace are Indonesia and Grenada, which together account for over 80- 85% of the world exports of these spices. Other producers of importance are Sri lanka, and to a lesser extent China and India.

In the international trade, nutmeg and mace are describled according to their region of origin. These is East Indian nutmeg from Indonesi. Nutmeg and mace from Indonesian Banda islands are described as BANDA type; from the Padang district of Sumatra as PADANG: from Moluccas as "AMBON" and "SIAUW" type, from Irian Jaya as 'Papuan'type. The Indonesian qualities are the dedium priced Siauw andAmbon types. The Nutmeg coming from Grenads, St. Vincent, Trinidad and Tabago, are known as the West Indian Type. The quality characteristics of the products from less important sources differ and these are categorised by country of origin India, Sri Lanka, Papua New Guinea. The Nutmeg and Mace from Grenads and Papua New Guinea are favoured for their high fat content and tend to be used for oil distillation. Sri Lankan nutmeg is distilled in Europe and special preference is shown to this origin for its odour,flavour and physical characteristics while giving the general nutmeg properties.

Another important factor in nutmeg and mace trade is that of grading. The two major producers group themselves under three broad classifications namely; Sound , Substandard and Distilling. The top quality of bothe East Indian and West Indian nutmeg (sound) is traded is grades defined according to the number of nutmeg kemeb per pound weight. eg. 60/70 per lb; 70/75 per lb; 80;90;100;110;120; and 130 per lb respectively. Unassorted nutmeg are marketed as "ABCD" for Indonesian nutmeg and for Grenada mixtures of sound nutmegs of varying sizes are offered as "sound un assorted". The defective kernels are marketed by Indonesia as "bow.p" (broken, wormy, and punky) . West Indian nutmeg from Grenado are marketed as "selected", "unassorted" and defective". Indonesion mace are graded as "No 1 whole", "No 1 broken", "No 2 whole" and "No 2 shiftings " andWest Indian mace as "No 1 mace " and "No 2 mace".

In Grenada sound nutmegs are selected by a water test. Sound nutmegs sink when they are placed in a basket partly submerged in water. the unsound ones generally float in water, substandard nutmegs from Grenada comprise of the "floaters" from the water test and others which are badly bruised, broken and damaged by insects are all categorised ad "defectives". In Indonesia sub-standard nutmegs are bus-classified as "sound shrivelled" and "BWP"(broken, wormy and

punky). The "sound shrivelled" are considered substandard only because of theri shrivelled appearance since they are highly regarded for their excellent volatile oil content. The distilling grades offered on the international market by Indonesia are graded "BSL" or "AZWI" which contain a small amount of shelll material and have a 12 - 13 % volatile oil content, and "BZA" or "ETEZ" which contain a relatively large quantity of shell material and have a volatile oil content of 8 - 10% . The distilling grade in Grenada comparises only "floaters" as distinct frim the mixed group traded as "defectives". Sri Lankan nutmegs are available, shelled and in shell, in three grades: No 1, FAQ and BWP. Grenodian cured mace is offered in several grades , namely whole pale mace, No. 1 , broken mace, selected , unassorted nd pickings. The Indonesian dried mace is offered either as whole , broken blader or shiftings.The main source of Indonesian mace are Siauw, Ambon, Banda end Irian Java.

Sri Lankan mace is available whole or in pieces in two grades. St. Vincent also offers two grades of mace. Although the grade designate given above for nutmegs and mace convey cetain quality characteristics, they are not well defined and products of similarly designated grades from different origins exhibit significant different characteristics. Therefore, the quality assessments in the trade, still depend largely on the individual experience and judgement of the buyer.

Nutmeg and mace essential oils are generally classified as East Indian, West Indian and Sri Lankan according to the origin of the spices but not necessarily the country of distillation , as nutmeg oil is also distilled in Europe particularly from Sri Lankan nutmegs. Oils from different origins have distinct odour, flavour, and physical characteristics while giving the general nutmeg properties. The East Indian nutmeg oil is considered to have a stronger and more spicy aroma and flavour characteristics and is broadly preferred to the oils obtained from the West India or Sri Lankan spices. West Indian distilled nutmeg oils have been unobtaibable, but Grenada has been planning for a long time to recommence distillation. Sometime in mid 1980's a European distilled "West Indian" nutmeg oil has been marketed. In Europe Sri Lankan nutmeg are distilled for nutmeg oils.

The bulk of the world production is of the East Indian oil. It is produced in Indonesia. The annual volume averages around 100 - 120 tonnes. Sri Lanka producers about 8.10 tonnes per annum. Distillation in the West Indies in recent years has been nil or negligible. The world market for nutmeg oil is recokned to be around 120-150 tonnes per annum.

The West Indian nutmeg industry is concentrated in Grenada. The country has been supplying small quantities of nutmeg oil from time to time but

the long standing plan to distill nutmeg and more oil has not taken off. However, there continues to be some trade indefective Grenadian nutmegs for distillation by the U.S. processors. Though the quality of theWest Indian nutmeg oil is generally accepted by the trade as good, yet the characterisities of the East Indian, particularyly Indonesian oils are familiar to and users and thus, this oil is generally preferred. Mace oil trade is very small and the volume of world production is not known. However, it is likely tnat a considerable proportion of mace oil is distilled from imported mace, in the consuming countries.

Nutmeg and mace oleoresins exhibit varying volatile oil and fatty oil contents, the relative propertions of which depend on the quality of the raw spices and the type of extraction solvent used. Commercial nutmeg and mace oleoresins are available with rolatile contents earning from 10-90% and 10-55% respectively. The manufacturer prefers to prepare olearesins according to customers requiremtnts and the products are therefore not classified according to origin. Most of the extraction is done in the consuming countries.

The annual international trade in nutmeg and mace is around 9500- 11500 tonnes. The 75% of the total production originates from Indonesia and 20% form Grenada. The

remaining 5% originates from Sri Lanka, India,Malaysia, Papua New Guinea, and few Carribbean Islands. The value of the world trade is around US $ 20-25 million.

The major importing countries are Singapore(74.33 tonnes) the USA (2500 tonnes) theFederal Republic of Germany (1350 tonnes) the Netherlands(1800 tonnes) France (650 tonnes) the U.K. (550 tonnes), Benlux (500 tonnes), Japan (100 tonnes), India (300 tonnes) Australia(150 tonnes) Denmark (375 tonnes), Brazil (100 tonnes) , Pakistan (100 tonnes) Iraq (50 tonnes), and Italy (40 tonnes) and (other around(250-3000 tonnes). The major exporting countries are Indonesia (7000-8000 tonnes), Grenada (2000-2200 tonnes), Sri LAnka (350 tonnes) and others (350-400 tonnes) . There is re-export trade form Singapore (6500 tonnes), the Netherlands (1000-1200 tonnes) , UK (75.80 tonnes), Federal Republic of Germany (125 tonnes), Behulux (115 tonnes) and France (80 tonnes.) Thus , the international trade not of re exports is around 9500-11500 tonnes annually.

The annual international market for ace is recokned to be around 1500-2000 tonnes valued at around US$ 10 million. The world production is dominated by Indonesian and Grenada accounting for 80% and 15% respectively with minor suppliers from Sri Lanka and Papua New Guinea. The major importers are Singapore (1500 tonnes), the USA (225 tonnes), Netherland(220

tonnes) . Federal Republic of Germany (500 tonnes), the U.K. (150 tonnes) , India (160 tonnes)and other EEC countries (240 tonnes), Japan (25 tonnes) , Pakistar (70 tonnes) and other (300 tonnes).

Thus for Zanzibar, whilst distilling nutmeg and mace oils , it could also offer a reasonable quantity of nutmeg and mace spices as an export product from Zanzibar and Pemba it is encouraged systematically. This would enable ZSTC to offer a basket of commodities rather than concentration one commodity cloves and clove stem/bud oils.

Nutmeg and Mace oil is obtained by steam distillation . The annual world production of nutmeg oil is around 150-250 tonnes. Of this 90% is produced by Indonesia. Sri lanka, India and Singapore supply small quantities and there is a limited manufacture of nutmeg oil in Western Europe. Production of oil in North Americal is mimimal. Grenada does not distill any oil at present.

The United States imports around 40 metric tonnes annually, valuing to US$ 4 million. The oil is mainly imported from Indonesia, India, France, the U.K. Singaport, Netherlands, andFRC. The second largest market is the EEC with the U.K., Netherland and France as important buyers. The Sri Lankan oil is mainly destined to France, Japan and Federal Republic of Germany, Indian exports are destined mostly to the U.S.A.

Mace oil market is not over 20 tonnes. Indonesia is the main producer and sistillation is doen at nutmeg oil distillation plats. There is a small production in Sri Lanka.

Nutmeg oleoresins are exclusively produced in N. America, N,W, Europe and Singapore. the two major producers are the USA and theU.K. for nutmeg oil. Canada is also an important producer. USA produces around 25-30 tonnes annually. The U.K. around 10-12 tonnes annually and Canada manufacturing around 5-10 tonnes annually. Singapore producer 2 tonnes of nutmeg oleoresins and France, FRC and the Netherlands producer only a few tonnes between them.

Mace oleorersins is produced in N.W. Europe, U.S.A. Canada and Singapore. The market is around 50 tonnes. The U.K. producer 15 - 20 tonnes, Singapore, Canada, France each producing 1 tonne a year. All production is used in producing countries.

Prices of nutmeg tended to decline in early 1980's. Prices for nutmeg picked up during late 80's. Since 1979 mace prices too increased. The current prices for nutmeg is US $ 2600-3000 cif London per tonne and for mace is US$ 5000-6000 East Indian per tonne compared to $ 8780 per tonne in May 1989. Nutmeg oil in Sept. 1984 in N. York was US $ 19.00-27.00 per kg for East Indian oil. Mace oil was US$ 26.00 per [illegible] pt. In July 1989 Nutmeg oil was quoted

at US$ 2640 per ton N. York.

The principal use of nutmegs is in its ground from in meat products, particularly sausages. Other uses are in seeds,sauces, baked goods and spice mixes generally.

Nutmeg and mace essential oils have a greater use or flavours than as gragrance material but only nutmeg oil is extensively trade. The main flavour use of nutmeg oil is in Europe is in meat seasonings (dispersed on a base) with lesser uses in bakery products , souces (tomato ketch up), soft drinks and pharmacentical preperations especially cough mixtures. It is also used to balance nutmeg and mace oleoresins. In the USA the most important use of nutmeg oil is in soft drinks of cola type. The other uses are secondary. Fragrance was generally of the oil are in men's toiletiries and to give spicy notes in perfumes. The trends in these uses are on the upward sooing.

Nutmeg and mace oleorersins are substituted for the basic spices in many industrial uses either in their semi-liquid form or dispersed on a base but have their largest usage in meat seasonings. There is a small use in bakery and confectionery products but their use in perfumery is minimal. Hence,

(a) Nutmeg be undertaken as an economic crop both as a monocrop as well as a mixed crop with cloves etc. including in the forestry programme;

(b) Concentrate on distillation of defectives, low and shrivelled nutmeg and mace into nutmeg and mace oil at Chake Chake distillery;

(c) Offer good quality spices as nutmeg and mace to target markets.

Although demand for nutmeg has reamined rather static and slow growth is seen in the FRG and Japanese markets. Though Grenada and Indonesia is an a strong position, yet for Zanzibar as a new supplier will not affect the market very much. The new changes in Comecon should undoubtedly be helpful in opening new vistas. The demand for nutmeg oil shows a slow and steady upward trend particularly in the USA. In Europe and in E. Europe the scope for increased usage in food processing industries is favourable though synthetic nutmeg oil can be produced from turpentine derivatives yet the natural oil will maintain preference and competitiveness. Zanzibarian nutmeg oil of course would be of the East Indian all and would be preferred in target markets. Mace oil could be a byproduct in the process. Another product that the distillery could take up at a later stage is nutmeg and mace oleovesins. This should be taken only with a range of other oleoresins to make any investment commercially viable and is best be left to private initiative with a joint venture under the Zanzibarian Investment law.

The trade structure reveals that it be traded by either ZSTC as well as by the private trade. Nutmeg oil and

mace oil should be exported by the ZSTC to maintain quality. In the production countries, in Indonesia, the state plays a little part as is the case in Sri Lanka. In Grenada both government and private exporters handle exprots. Traders in London , Hamburg, Paris, Netherlands re exports and many processors prefer to buy from the trade because they require small quantities. Packaging is in metal drums of 10 kgs with removable lids. Some use 25 kgs plastic pails also. It is recommended that the cultivation of nutmeg both for nutmeg and mace as spices and as raw materials from defective nuts and mace for oil distillation be encouraged. To begin with the 6 tonnes of crop from about 400 trees found in Kizimbani be sent to Chake Chake distillery for distillation and introduction of the oils to selected buyers for their opinion. The plant should be encouraged in Pemba in existing clove areas and as a mixed crop in the agro-forestry programme. The distillery also initiate action to plant a minimum acreage in a nucleus plantation inChake Chake as a long term proposition. The crop is suitable for consideration for long term development.

In Zanzibar the West Indian type is grown and the Zanzibar nuts are small. In 1958, nutmeg oils were distilled from the nutmeg in Zanzibar oil distillery and found that the oil was of West Indian type. Yield of oil was 13.3% . It had a pleasant odour and flavour.

On the basis of 35 lbs of nuts per tree roughly 6.25 tonnes could be collect which can yield 0.83 tonnes. At current prices of US$ 2640 per tonne, a foreign exchange earning of US$ 2191.20 compared to US$ 15625 from sale of nuts as spices at current prices.

4.11: CARDAMOM OIL

Cardamoms known locally as Iliki is available in Pemba and Unguja. It sells retail at Tsh 1000 per kg. The crop does very well in both islands. The world market is complex because it is based on two very different cultivars - Mysore and Malabar - and has three different end users markets.

(a) Middle East "gahwa" coffee market

(b) World axile culinary market

(c) Cosmetic/perfumery market for cardamom oil and oleovesins.

The world consumption will remain static or increase slightly and Zanzibar can penetrate this market but quality of drying and production needs improvement. It is easy to penetrate into the Middle East "gahawa" coffee market in a big way if the capsule are grooner. The second market is easy to peneterate and in the case of the cosmetic/perfumery market. The distillery at Chake Chake can distill the existing low quality capsules and seed to distill cardamom oil. GOZ encouraged in the late 70's to establish Malaba type on privately owned clove holdings. Little or no follow

up work has been done. The expert saw for himself the cardamom plots under nutmeg done at Kizimbani which are healthy and produces a good crop of capsules. The crop should be collected by the ZSTC and sent to the Distillery for oil distillation..At present the cardamom crop is sent to the Mainland. Pemba also has wild cardamom known as Matungaru (Afromomum angustifolium k. sch) which too can to distilled for oil. Cardamom in Pemba has a health crop growth.

Cardamom oil is produced by steam distillation of the seeds of the commercially treated Eletaria Cardamom. The volume of the production is around 10-50 tonnes and the international trade is recokned to be 5 - 10 tonnes per annum. The prices are as high as 250/kg (French/Indian) cif London. In the New York market in July 1989 a price of US$ 77 per kg was quoted. The main producers are India, Sri Lanka, Guatamala with India being the dominant.

Cardamom oil possess a warm, sweet, spicy note which renders it attractive for use in certain perfumery compounds notably those with a floral base. As flavouring, it is ofter used with the cardamam spice by the canning industry and in the production of pickles and sauces including seasonings.

A proportion of India's cardamom oils is consumed domestically. The main destinations for internationally traded cardamom oil are Western Europe , Scandivavia, and the USA. The lack of published date renders a quantitative breakdown impossible. Consumption of the oil is possibly increasing slightly. There is no synthetic substitute.

Zanzibar has the opportunity, good agro-climatic conditions, suitable cultivars, interests and a market for cardamom.The stainless steel distillery has the capacity, know how to produce good quality clean cardamom oil which should get a premium price. The expert recommends cardamom as a high priority crop which should be taken up in the short run to maximuze the earnings, diversification mix and the use of the distillery capacity.

4.12: PEPPER OIL

This is an oil distilled from the small berry of the Piper nigrum vine, belonging to the family, Piperaceae. Locally black pepper is grown and is known as pilipili manga. Black pepper is the dried unripe fruit of the plant, White Pepper is the product obtained from the ripe or unripe fruit by soaking and treating the berry before dryingand thus, removing the merocarp. Green pepper comes from the unripe but fully developed pepper berries.

Pink pepper is not true pepper but is probably the dried fruits of the pepper tree Schinus molle origi nating in Latin America. Pepper oil by solvent extraction of black pepper. Ground pepper is obtained by grinding white pepper.

The world production of Black pepper is 146,000 tonnes (India - 65,000 tonnes; Brazil - 35,000; Indonesia - 20,000 tonnes;Malaysia - 26100 tonnes). The total international trade is around 123,300 tonnes; (India - 40,000 tonnes; Brazil - 30,000 tonnes; Indonesia - 1400 tonnes; Malaysia - 24300 tonnes; Vietnam - 6000 - 7000 tonnes;Sri Lanka - 3000 tonnes ; Thailand - 4000 - 5000 tonnes, and Madagascar - 2000 tonnes), The world production of white pepper is 7200 tonnes (Brazil 1500 tonnes; Indonesia - 2800 tonnes; Malaysia 2900 tonnes). The exports is in the region 27,200 tonnes (Brazil - 1500 tonnes; Indonesia - 23,000 tonnes; Malaysia - 2700 tonnes) (Vide: Pepper Tech meeting - International Pepper Community June 20 - 25 May 1990 London) . The world production of green pepper is 2000 tonnes with Brazil , Madagascar and India as major exporters. Small quantities are exported dehydrated from India. The world pepper oleoresins production is 400 tonnes an is supplied by India, Malaysia, Indonesia and Indonesia , together with the US , the UK and FRG having an

extract capacity of 300 tonnes, making excess capacity f feature in pepper oleoresin indistry. The pepper oil International market is 15-20 tonnes per annum. The USA and the Federal Republic of Germany each take some 4.5 tonnes annually. The other significant importers are the United Kingdom, the Netherlands, Switzerlands and canada, each importing about 1 - 2 tonnes annually. Indonesia exported 12.13 tonnes of pepper oil. India exports 10 tonnes out of its 20 tonnes production.

Overall demand for pepper oil is moderately on the rise. Its use in the perfumery sector is comparatively static, the expansion in demand taking place mainly in the soft drinks and processed-food sectors.

Zanzibar, mainly Pemba is ideal for pepper cultivation. The yield in Pemba is 1 kg of dried pepper per vise. The crop is very important to be encouraged. Short term varities are required. It may be worth screening some cultivars from India , Sri Lanka, Malaysia and Indonesia in experimental plot to be established in Pemba at Makuwe or at Mtambwe area. Agro climatically Pemba is suitable. It is recommended that a nucleus of growers around the Chake Chake area be selected and purchase their black pepper for oil distillation. The demand for black pepper is increasing at 5% per annum, green pepper at 4-5%

per year and pepper oleoresins at 6% per annum. The world price for pepper currently is as follows:-

Black Pepper	Lampong	Sarawak	Brazil
Holland	$ 1900 FAQ M/J	$ 1500 FAQ M/J	$ 1900
Germany	$ 2000 spt $1950	$ 1850 spot	$ 2100 spot
U.K.	$ 2150 spt ASTA	$ 2100 BLUE Lable	$2125 spt USA
Japan	$ 2000 spt	$ 1650 spt $ 1600 FAR	$ 2315 spt $ 2225
Singapore	$ 1525-1575	$ 1525-1575	

White Pepper

	Muntol	Sarawak	Brazil
Holland	$ 1700-1750	1800 spt	-
Germany	$ 1700 spot	-	$ 2300 spot
U.K.	$ 1800 spot 1700 ADL	-	-
U.S.A.	$ 2050 spt/1961 JNL	-	-
Japan	$ 1900 spt 1900/1850 FAQ	-	-
Singapore	$ 1860-1880	$ 1880	-

Chinese White

Hongkong $ 2950

FOB HK

Pepper oil fetched an average of US$ 72 per kg. Pepper oleoresins fetches US$ 46.28 per kg (40% piperince). It is best for Zanzibar to encourage pepper in a big scale in Pemba and based on it distillery could use part of the output, whilst ZSTC and the private sector could export surpluses after meeting local demand. The price of pepper is Tsh 2000 per kg. The crop would start bearing from year 3 and would be a good intercrop in clove as well. The crop is a high priority short term one.

4.13: GINGER OIL

Locally known and grown ginger iscalled Tangawizi. The local price of ginger is Tsh 120 per kg. The price of Ginger (Coshin) cif was $ 1650 per tonne in May 1989 and in May 1990 it rose to US $ 1900 - 1925 per tonne. Ginger oil was quoted $ 37.80 per kilo (Chinese spot) and US$ 46.70 (cif) per tonne(May 1990). Ginger prices in June was:

	Indian/Cochin	China W	China/Sri Lanka
Holland	US$ 1900	$ 1700	$ 1500
FRG	US$ 2000	$ 1880 spt	$ 1250-1600 spt
USA	US$ 1875 spt	$ 1720 spt	$ 1455 spt
U.K.	US$ 1950	$ 1700	-
Japan	US$ 1950 spt 1800	$ 2500	$ 1800 spt
Middle East Nug	US$ 1850-1900	$ 1800	-
Lower Gulf Parts nuge	US$ 1995	$ 1745	-
Hong Kong	-	$ 1850	$ 1600 sliced FAQ 1400 FOB U.K.

Ginger oil is produced by steam distillation of dried, unpeeled, freshly ground rhizomes of Zinzibar officinale. Although it was distilled mainly in the West, production nowadays take place principally in India and China with only small quantities being processed in the USA, the U.K. and other Western European countries. The oil is also distilled in Jamaica, Sri Lanka,Indonesia and one or two other countries. Ginger oil is rarely itemized in international trade statistics. A reaslistic estimate of world production would be about 30 tonnes per annum of which nearly 20 tonnes are exported.

Ginger oil is used largely as a flavouring material in various alcoholic and non-alcoholic beverages. It also goes into confectionery and perfumes, and is occasionally admixed with ginger oleoresin to restore an ideal balance between aroma and purgency in the ginger oleoresin.

India exports between 6 - 12 tonnes per annum. China supplies about 8 - 14 tonnes per annum. The main markets are the USA, EEC and Japan in that order. Demand tends to vary from market to market, but the overall prospect is one of a moderate increase, in line with a generally rising trends for the soft drinks industry.

Ginger is an easy crop to grow in Pemba and the crop is known by the people. It is a crop with a short gestation period. It is recommended that a reasonable acreage be encouraged for distillation of ginger oil at thePemba distillery.

4.14: PATCHOUL OIL

There are several tropical plants possessing a patchouli like odour. Plant from which the Patchouli oil is obtained is Pogostemom cablin Benth also known as Pogasternon patchouli Pellet. The plant grows wild and now is cultivated for essential oils. The oil is obtained by steam distillation of the dried leaves of Posgostemom cablin. The oil is popular in the cosmetic industry. This is 50 because

(a) It is rich in woodiness with subtle hints of a wide variety of herbs;

(b) The distinctly mother earth like character

The harmonious blend of the woody, earthy and camphoraceous notes renders this essential oil a favourite and an important ingredient in perfuem compounding. Two important sesquiterpenic alcohols are norpatchoulend and one the principal of the oil depends on several factos

(a) The cultivar grown;

(b) The cultivation and harvesting regime;

(c) The drying and storage practices for leaf and stale prior to distillation.

(d) The distillation technique

(e) The subsequent handling and storage of essential oils

Aged oils tends to have a finer and full fragrances than freshly distilled oils.

Patchouli oil has traditionally been one of the most important natural raw materials used in perfumery and this is tree to a large extent today. It has

(a) Strong fixative properties

(b) Helps to prevent excessively rapid evaporation of a perfume

(c) It promotes Fenacity by helping to prevent excusively rapid evaporation therefore suitable for heavy perfumes and for the imparting of a lasting character and strength to lighter perfumes.

(d) It has a dom woody - type note, though aroma possess other characteristics

(e) It is very complex in fragrance

In a typical oil the sweet character of the fragrance should persit throughout all stages of eveporation. There are difinite difference between patchouli oil from various sources and user requirement also vary. Generally, the olfactive value of the oil, which is the strength of the fragrance for a given volume of the oil, is of major importance, therefore, the percentage of the oils constituents attributable to the alcohols (which are the main contributors to the oils special character) is a primary consideration.

(f) Patchouli oil has 23% - 55% patchaoulol in the oil, averaging about 33% by volume, among other minor alcohols between 0.4% - 0.6% of the oil is usually attributable to norpatchoulenol.

(g) The oil has so far defied all attempts at accurate synthesis because it is still not known, in spite of modern scientific and olfactive techniques of analysis which components or combinations of components are primarily responsible for Pantchouli oil;

(h) If the components are even identified it would be costly to synthesise. The pautchouli oil although not exclusively used in products at the upper end of the market where its woody character is constantly popular. It is blended with other essential oils like clove and/ or geranium oil before use.

The oil is used in a wide range of toilet soaps, scents r women, body lotions for men, pre-shave and after shave lotions, in few household products including detergents. It is used in heavy perfumes and in light perfumes. The consumption growth of patchouli oil has been inhabited by

(a) Erratic growth;

(b) Excessive price variations;

(c) Quality problems interms of poor colour;

(d) adulteration practices;

(e) undue variations in odour a chemical composition Therefore, patchouli oil at present enjoy less prominance in now perfume creative chat it once did;

(f) It is basic building block in a whole range of perfume. It is not a fashion sensitive oil

(g) It is an oil in its entirely rather than a source of any of its traditional components. It is used mainly per se.

(h) It is never subjected to deterponation though at times refined.

(i) The oil improve with ageing and therefore, some stock large quantities in stock.

(j) Excessive dark colour or presence of undue level of foreign matte in the oil due to inadequate filtration.

The world production of patchouli oil is 500-550 tonnes per annum and the world consumption is 500-525 tonnes per annum. Indonesia is the traditi

principal source and supplies 80% of annual world production. China, Taiwan Brazil and few Carribbean islands supply the remaining 20% Seychelles was once an important produce, is no longer a supplier.

Indonesia - Sumatra is the principal source of patchouli oil. The annual production is variable, in the region of 400 - 450 tonnes per annum. Since production is a small holder activity there is no clear trend in the level of production resulting in annual fluctuations. Total production is exported. The structure of the industry reveals that small holders distills the oil for ½ a day and the oil is sold to village merchants/ vendors who in term seels it to exporters at Medan port. The bulk of the production is in the sidikalang high lands which supplies 10% and the district of Atgeha supplying 24% crop and the Nias island supplying 60% of the crop. The plant has two disadvantages:

(a) It is soil exhausting and therefore, there is rather limited facilities for crop rotation.

(b) The problem of mematock attack and therefore, the crop has to be shifted.

The patchoulol content in Indonesian patchouli oil is 29%- 33%. The average exports have been 420 tonnes (1976-1980) of which 25 - 33% is exported through Singapore and through transhipments at the Malaysian port of Penang. Western buyers prefer to purchase from Singapore due to:

(a) Shipoing and financial advantages;

(b) Questionable trading practices by traders at Medan;

(c) Adulteration with oil from gurjun balsam in Indonesia, palmoil and other vegetable oils;

(d) Singapore traders have facilities for quality control of consignment for cleaning, grading and bulking of the oil.

People's China - The Average production is in the region of 50 - 80 tonnes annually. Of this 26-30 tonnes are reported to the Western markets, 20 tonnes to Malaysia and Singapore where it is blended with Indonesian oil for Yesale, 30 tonnes are consumed within China. The plant is grown in the Mainland and in the Hainan island. The crop is grown in plains in China compared to Indonesia where it is grown in maountainous terrain like those in Pemba. The Chinese patchouli oil has high level of acids and esters, lower levels of alcohols(23.25% patchoulol) compared to the Indonesian oil. It has a less sweet character. This makes Chinese oil having limited applications in consuming countries. It is generally blended with Indonesian oil before use. Chinese oil is usually sold on specifications unlike in Indonesian oil which is normally traded on a sample basis. There are three grades on offer on the basis of the soluability in thonol - namely 1:7-9; 1:11-12(most popular grade) and 1:10-14. Since the Chinese administration decentralized marketing,

Chinese oil has become competitive. The insistance of the Chinese authority on selling on the basis of space rather than on the basis of samples is the major deterrent to marketing.

Taiwan - The local production is small and they now imports Indonesian oil refines them in modern equipment for re exports to the Japanese and the European markets, theryby making Taiwan oil on offer, a different character to Indonesian oil. The following favtors militates against successful long term Taiwan participation in the Patchouli oil trade.

(a) High labour cost;

(b) Recoteness from the main markets(Except Japan)

(c) High cost of shipping;

(d) High prices.

Brazil - The crop production ,distillation , exports are undertaken by a Japanese firm near theport of salvador in the Bahia state. Production at present is 1 - 3 tonnes per annum. The product is mainly marketed internally, and small quantities are exported. The is of good quality light colour closer to Indonesian oil than the Chinese oil.

India - The crop is distilled for internal are, and is unsuitable for use in most consuming countries. North Indian oil is closer to Indonesian oil in character. There is a demand for the oil in the country and it is therefore, a net importer of parchouli oil..

West Indian countries like Dominica, St. Vincent and Martinique which developed the crop have given up after trials. Seychelles was an exporter of the oil since 1970 but its exports have declined since then to zero due to the inroads of the tourist industry into the lands where the crops were traditionally grown and the mobility of labour away from the oil industry. Guatamala trials in the 1960-1970;s failed because the potchouli could not stand local conditions and the crop rotation was not undertaken sufficiently to combat problem of soil exhaustion. Mexico was producer and exporter of the oil but have since given up. Madagascar is an occasional producer and exporter of potouchli oil like Reunion.

USA	- 40.0% (250-300 tonnes) valuing US $ 20 million
U.K.	- 10.0% (45060 tonnes)
France	- 9.0% (40-50 tonnes)
FRG) Netherlands) Switzerland)	- 20.0% (105-170 tonnes)
India	- 10.0% (50 tonnes)
Japan	- 6.0% (30 tonnes)
Others	- 5.0% (20-25 tonnes) (Spain, Poland, Pakistan, Eastern Europe)
	100.0%

The pattern of imports to the US market is as floows:

Source of Import	1986 (tonnes)	1987	1988
Indonesia	280.00	233.50	230.70
France	2.39	14.0	17.86
Switzerland	0.45	0.53	0.87
India	15.2	-	0.59
Japan	-	-	0.50
Leeward/Windward Islands	-	-	0.16
PRC	-	1.0	0.10
British Indian Ocean Territory	-	19.0	0.10
U.K.	3.4	0.7	-
	301.0	267.0	250.0

The market for the oil in the USA is on the upward swing. 90% of the oil come from Indonesia. The trade tolerates up to a mixmum of 1% adulteration of gurjan baliam.The Chinese oil is not preferred since even to blend is difficult due to characteristic difficulties. The high price in 1980-89 period militates against its use. Brazilian and Taiwan oil are accepted in the USA. The market prospects are good. No synthetics exists but competes with cedarwood and gualau wood oil in Patchouli oul usage.

In the UK Market the consumption is around 45-60 tonnes per annum.They reexports some oil.The major suppliers are Indonesia via Singapore. U.K. uses little of the Chinese oil as an extender to the

Indonesian oil. Small quantities of oil is imported from Brazil and Malaysia occasionally. Patchouli oil is widely used in the U.K. Purchases are directly sone by large users and also uses the dealer/broker network. The prospects show can slow growth in demand. The outlook is moderately promising.

The French market is about 40-50 tonnes annually. There is re exports to the USA, EEC and the Eastern Europe. The imported oil is refined at Grasse. Imports are done direct from the source. Some uses dealer/brokers in Paris, Marselles and Bordeaux. There is a preference for Indonesian oil imported via Singapore.

The market growth is slow but steady.

The FRG annual imports are 35.40 tonnes annually. Imports are done via Hamburg, and Bremmen through dealers/brokers. However, big companies imports directly from source. There are re export too form FRG. There is a preference for Indonesian oil. Trade is done on a sampoe basis through Medan. Chinese oil is also used, as an extender. The oil is used in the up market soaps, cosmetics, lotions, range of scents for women and in certain detergent products. There is a stable level of growth in the market.This is a good and a stable market for Patochouli oil.

The Datch market is 30 tonnes per annum. The imports are via Roteerdan. There is a preference for Indonesian oil. The trade and users tolerates a

maxinum of 1-3% gurjun alsan oil in the Patchouli oil. Colour is important in the Netherland market. The oil is used in perfumery, cosmetics and household products. In this market the oil is fashion sensitive. The Swiss Market consumers 40-50 tonnes annually. Two or three processors and small buyers dominate the market. The preference is for Indonesian oil. However, about 20% of the requirements are of Chinese oil imported for blending by importers themselves. The prospects for the crop is good.

The Japanese market imports 30 tonnes per annum. Indonesia, China, Taiwan, France are main regular sources. The oil is used in the perfumery market.

The Indian market is large but imports about 50 tonnes annually form Singapore.

The other markets absorbing 20- 25 tonnes annually consists of Poland, Spain, Pakistan and Estern Europe. Polish and the Eastern european markets offers good scope for the oil.

The market structure reveals a domination of the trade in Indonesia by the private enterprise whilst in China it is by a state regulated corporation. 25-35% of the Indonesian exports are via Singapore or Peneng, where the oil is received m deaned, rectified and blended with Chinese oil. In the main importing countries,patchouli oil has traditionally been marketed through a network of

intermediaries which includes dealers, import merchants, brokers, agents and various and users among whom the processing and compounding houses predominater. The oil is traded on a sample basis. The Chinese oil is sold on specifications in three well defined grades, Payment is on c.a.d. (cash against document basis or on the opening of a l/c.

The packaging is in 45(200 litre) gallon metal drums.

Prices fluctuates in international markets. In 1979-1980 peaked to US$ 48 kg cif UK, in 1981 it was US$ 28 per kg (cif). At the end of 1981, it rose up to US $ 30-32 per kg. In May 1989 it was US $ 10.75 per kg. In 1990 (May) it rose to US $ 22.80 (nominal) and 19.80 US $ (UK) per kg. The trade feels a reasonable price would be around US $ 20-29 for Chinese oil and US $ 27-35 per kg for Indonesian oi. The International standard for the oil are ISO - 3757: 1978. EAO of the USA - EOA No. 23 and the BSI - BS 2999/10:1965.

The prospects for this fashion oriented oil, which is a basic perfumery material is reasonabiy good.

The market for the oil is reasonably good. Zanzibar may have to import high yielding cultivars of Pogostemom cablin Benth of the disease resistant varieties. It will do well in the tropical climate

in Pemba with well distributed rainfall and three month dry spell. It could be grown in the soils of Pemba. What Zanzibarians should be careful is that since it is succeptible for nematode attack, rotation is important. Therefore ,if the crop is to be taken up for develoment virgin land is suitable for planting. The land should also have good drainage. Propagation is done by stem suttings raised in the Nursery beds at a spacing of 0.7 x 1 meter x 1 meter. Weeding is required.

Generally, hoeing and fertilexers improves the soil. The first crop can be taken in 6 months when theplant is 0.5 - 1 meter high, and best be done with the rains. Harvesting can be done every 4 - 6 months interval for three years, when replanting is necessary. The leaves are harvested, sundried on concrete floor or mosts for three days andthen distilled the yield of dried leaves are 3090 kg/ha in year 1, 1000/Ha in year 3.

The oil yield is 3% or 3-90 kgs per ha per year. The average oil yields over the plant life of 3 years is 60 kgs/Ha per year. It takes 6-24 hours for distillation of the leaves into oil. Sometimes depending on the planting material oil yield can cary from 2-5% . The Pemba distillery can produce a clean oi. The packaging of the oil is a galvanizing coin of internally expoxy

resin locquered new wild steel drums of 200 litre capacity. International standards are EOA No. 23- USA, BS 2999/10: 1965 and ISO 3757: 1978E. The crop has the advantages of prices, agriculture suitability, distillery available capacity , capacity to produce high quality oil at Pemba, as an alternative foreign exchange earing crop as a new esportable oil being a high value- low volume product with no threat of substitution by synthetics. It is a labour intensive crop with neglegible additional investiment requirements. It may be worthwhile to consider 15-30 hectares under the crop which with an average yield of 2000 / kg/Ha/Year of dried leaf would yield 900-1800 kgs of oil.

4.15: PALMAROSA OIL

Palmarosa oil is obtained by stem distillation of the vasha grass Gymbopogon martini (Roxb) Walts var. motia Stapf. which grows wild in Central America, Brazil, Madhya Pradesh, Maharasta and Andhra Pradesh in India. The quality of oil from wild grass is poor. New varieties of palmarosa has been developed at CIMAP India namely CIMAP/CMP - 1 , CIMAP -PRC - 1 both synthetic varieties given 40-50% higher oil yield. The oil has over 88% geranoil. The tall perennial sweet scented Palmarosa grass grow in the drier localities and may be suited to the coral BAg areas in Pemba, especially to the

open area near castro school and the Army camp.

The oil is pale yellow in colour with a characteristic geranium odour conctaining on an average 85% to 93% geranoil. It is used as a base for perfumes and cosmetics especially in soaps.

Palmarosa oils rose like or geramium like character renders it suitable for incorporation into cosmetics and fine perfumes and, to a very small extent, for use as a flavouring agent. Geraniol of high quality is isolated from the oil andis used in various floral perfume compositions. However, this application is restricted to the upper end of the market as cheap, synthetic geraniol is abundantly available and is the normal choice of perfumers for products not requiring the finest olfactory characteristics.

The oil has dipentene and d-limonene as constituents with high geraniol content.

An appreciable portion of the Indian and Brazilian palmrosa oil is consumed domestically. The oils main overseas markets are in France and the USA.

The imports of palmarosa oil to theUSA are as follows:-

Table IX imports of Palmarosa oil : USA

Origin	1986 tons	1987 tons	1988 tons	1986 Min US$	1987 Min US$	1988 Min US$	Unit price US$ per kg. '86	'87	'88
India	11.1	2.6	4.9	0.3	0.09	0.17	31.56	23.09	27.7
Guatemala	2.6	3.6	4.3	0.05	0.08	0.9			
Brazil	1.9	5.0	3.6	0.06	0.16	0.08			
France	-	0.09	1.0	-	0.002	0.03			
Paraguay	0.5	-	0.7	0.02	-	0.02			
Indonesia	-	10.0	-	-	0.15	-			
Total/Tons	16.4	21.4	14.7	0.5	0.4	0.4			

Source: US Dept.of Commerce

The price of palmarosa oil in Feb. 1989 was Indian $ 794 US $ 33.00 per kg(FOB) Brazil (FOB) US$ 25.00 per kg . In October 1988 it was $ 41.00 for Indian oil and US $ 28.100 for Brazilian oil. April/May 1988 it was US$ 35.00 per kg for Indian and US $ 28.00 per kg for Brazilian oil. In December 1987 it was US $ 42.00 for Indian and US $ 30.00 per kg for Brazilian oil.In May 1990 palmarosa oil fetched US $ 33.50 per kg (cif) for East Indian oil the demand for the oil is slowly growing.

It is recommended that this crop be developed in Pemba in the drier coral rag areas. The grass can be utilized in the distillery. The distilled oil should fetch premium prices due to pale yellow clean oil that can be distilled in the Chake Chake distillery.

4.16: YLANG YLANG AND CANAGA OILS

Ylang-Ylang (Canaga odoraterm forms geneins) is a high grade , sweet smelling essence which provides the topmotis in famour prefumes (Revloris Charlie, Chanell Classic No. 5) The oil was introduced to Europe perfumers in 1864, ylang ylang grows in the moist, voloanic soils of the Comoros, Reunion and Madagascar. It grows in Unguja at Kizimbani. The trees are healthy and bearing flowers well in

three years. The trees are topped annually to a height of 6 ft in order to facilitate flower picking for distillation. Yields in Zanzibar exported are of oil per acre.

Year 1 - 8.3 lbs of oil

Year 2 - 8.12 lbs of oil

Year 3 - 6.06 lbs of oil

Year 4 -13.86 lbs of oil

Zanzibar oils are similar to the Madagascar oil. Once ylang ylang is established very little seeding is necessary. Main labour requirement is for pruming and harvesting.

Pruned trees yield 20- 30 kgs (45-65 lbs) of flowers throughout the year. Main harvesting season is between April and June. The yellow blossoms have to be collected in basket before the sun is high. The oil is distilled by steam. Canaga oil is obtained by distillation form C. Odorata, forms macrophyla which is a native to Java and the Phillippines. IT is cultivated in Malayasia, Reunion,the Comoros, Madagascar(Nossi - Bi), Zanzibar and in certain most Indian and Palynesian islands.

The distillation process is lengthy. Normally it is interrupted periodically in order that oils of different grades can be collected. The quality of the canaga oil is inferior to all but the lowest grade of ylang-ylang oil primary arising from the distillation method, differences in soil and

climatic conditions. The highest grades of ylang - ylang oil is known as "Extra" is drawn off the distillation after 90 minutes. It takes 350-400 kgms (770-880 lbs) of freshly picked flowers to produce a full kilogramme of (22 lbs) oil. The lowest grade which is used in the manufacture of soaps cna cosmetics, takes over 13 hours to distill.

The hub of the ylang - ylang trade - valued at only US $ 3.5 million per year world wide is the comoros islands, a tiny Islamic Republic of the coast of mazambique which produces 80 tonnes out of the 100 tonnes traded world wide. In 1983, the three islands exported 74 tonnes of oil tc France, its major buyer; 60 : of that was produced by oral holder farmers with their own backyard distilleries. In 1989 the trade is around 100-40 tonnes of which 80% is supplied by Comoros, and 20 tonnes in Nossi - Be island in Madagascar. World producction of canaga oil is about 35.50 tonnes yearly, nearly all distilled inJava island of Indonesia.

The limited availe land and growing population are a threat to ylang ylang and canaga in Comoros and Madagascar. Many small holders have begun to uproot their trees to make way for manice and bananas, which grow well in volvanic soils.Low returns to the small holders have also led to a decline in the quality of ylang- ylang.

Ylang - Ylang oil is a popular essential oil that can be used to improve many types of floral fragrance. The best quality oil is used in high- class perfumes of the floral and heavy oriental types, in which the oil blends well with other essential oils. The lower grade ylang - ylang oils are employed widely in soap perfumery and as comparatively low-cost floral materials for ecents, such as hyachinth and lilac. canaga oil also goes into soap perfumery and men's toletries. In soap applications, it had some advantage over the lowest grade ylang - ylang oil, owing to its superior stability and tenacity. A terpeneless canaga oil, is sometimes sold as "synthetic ylang - ylang " oil.

France is the largest market for ylang- ylang and canaga oils. A considerable volume is refined and reexported mainly to the USA , which takes about 45 tonnes per year as given in Table X below:

Table X Imports of Ylang Ylang, Canaga oil into the USA

	1986 tonnes	1987 tonnes	1988 tonnes	1986 Mln US$	1987 Mln US$	1988 Mln US$
Total	32.37	37.27	41.20	1.76	2.11	2.69
FRance	24.6	32.49	37.49	1.5	1.9	2.4
Comoros	0.9	0.6	1.91	0.04	0.03	0.10
Indonesia	4.6	0.2	0.87	0.07	0.006	0.02
U.K.	1.4	0.2	0.5	0.03	0.02	0.03
Switzerland	0.37	0.29	0.38	0.03	0.03	0.05
Netherlands	0.3	0.25	0.05	0.01	0.02	0.001
Japan	-	3.2	-	-	0.03	-
FRG	-	0.04	-	-	0.03	-
Morocco	0.2	-	-	0.05	-	-

Source: US Dept of Commerce

Some quantities are reprecessed in Grasse France before re exported. The oils are also widely used in the EEC countries other than France and significant quantities marketed in East and South East Asia.

There appears to have been a degree of competition and interchangeablety between canaga oil and lowest grades of ylang - ylang oil over the years. In 1970's and there were considerable stock of unsold Comoron Grade 3 ylang ylang oil mainly as a result of the then low canaga oil price. In the 1980's the situation appears to have altered somewhat. the price of canaga oil having risen in relation to that of Grade is ylang - ylang oil have influenced the change. The prices of Ylang Ylang oil is US$ 52.80-96.80 per kg (N. York) (July 1989) whilst Canaga oil fetches US$ 27.30 per kg (cif) Java (May 1990). In July 1929 in the Nork York market Ylang Ylang oils fetched.

Extra Grade lb US $ 44.00 - 52.00

Grade i lb US $ 37.00 - 44.00

Grade II lb US $ 29.00 - 35.00

Grade III lb US $ 24.00 - 27.00

Source: Chemical Marketing Reporter

July 31, 1989.

Cananga oil in July 1989 fetched 18.10 cif per kg.

Zanzibar has 2 acres of Ylang Ylang in the Unguja Island mainly the Kizimbani Agricultural Experiemnt Station with plats floweing during the Mission.

The experience have proved the oilyields have been 2.55 . Since already a planting stock is availableand flowers needs to be distilled within 2½ hours after plucking the question of flying flowers to Pemba is out of the question based on the unreliable airservice. It is recommended that the acreage at Kizimbani be exported to 10 Acres and a mobile or a small distillery be developed in Unguja. For Pemba, an acreage of 5 Acres could be developed in proxinity to the distillery from either local cultivars or cultivars imported from Comorcon. The tree starts bearing in 2-3 years after planting.

4.17: OCIMUM OILS

There are several ocimim species growing wild in Pemba and Unguja which have given potential oils. Labiatae, Masquito bush, Kivumbashi, Jembe la Waganga, Vuo Mtulie, Artimisia Annua are a range of new local essential oil crops identified for further development. The analysis by the National Bureau of Plant Genotic Resources New Delhi , India revealed the follow ing rusults. Ocimim canum/O.grathissium (?)
The oil constitues manly of 71.22% engenol, 7.26% engenol acetate and low boilers (11.53%) which included B- ocimone as major component.

Ocimim suave _

This is locally called Kivumbasi having larger lasting camphoraceous and herbal note. The major components

are 1:8 - Cineole (40.30%) camphor (25.93%), B caryophyllens (5.14%) and B- elemene/oc-copaene (3.27%). It is said it can find use in perfumery formulations for shompoos. According to R.O. Williams (vide: Useful and Ornamental Plants of Zanzibar and Pemba, St. Anns Press, Temperley, Altrinchama 1949) This is an annual herb commonly found as wayside weeds and characterised by their strong and pleasant aromatic odour. Theyhave numerous inconspicious tiny flowers with membranous, persistant calyees borne is whorls on erect racemes. The leaves and seeds are used as a pot herb; the leaves are used medically for stomach troubles by local women. The dried plant is burnt as a mosquito repollent. The leaves yield as an essential oil by distillation.
Another plant locally known as Mrehani having red inforescence and red stalk produces an oil having mainly methyl chaviool (90.36%) and linalool(3.02%).

The oil is suspected to be similar to O.basilioum and oil composition is more like oils from Madagascar, Comoro and Reunion Islands. They type of oil has good acceptance in perfumery formulations, where good quality fresh basil is required. O. Sps (?) is another ocimum plant having purple flowers and leaves giving sticky resin on crushing. Its oil has herbal, earthy followed by sweet note. The oil is rich in

sesquiterpene hydrocarbons (B-caryophyllee 30.43%, B- elememo/copaene 7.87% and monoterpenic hydrocarbons (B - pinene 25.97% limonene 11.44% and p-cymene 7.35%.)

Ocimum has been used in the Indian medicine partly in Siddha medicine. These are unrecorded uses in the household and ethnomedicinal remedies and antimicrobial antiferngal, antiviral, and anthelmintic activities. It has intrinsic perfumery and / or pharmaceutical interest. Work is being done in the faculty of Pharmacy, Cairo University and by the Division of Harticulture University ofAgricultural Science , Bargalore, India, on Ocimum. basilicum and O. Canum which are the UNIDO project can follow for the nenefit of the Pemba ocimum development. Ocimim gratissimim Linn has been developed as an othermotive source of clove oil Ocimim gratissimim named "Clovimim" yield oil averaging 0.5% FB having 60-65% engenol, 10-15% myrcene and has been released in India for Industrial uwe, by the Regional Research Laboratory , Jammu Tawi, India.

Before any commercial cultivation of the various ocimum varities are done, it is worth distilling small quantities of the oil sending samples to Grasse, Genera, Poland , India for opinion from the leading perfumery firms. Meanwhile a literature survey of ocimum needs to be done. The project should try to isolate the ajor ingredients in ocimim oil like

engenol, engenol acetate, cineole, camphor, methyl charicol, serquiterpene hydrocarbons, monoterpenic hydro carbons and offer in small quantities to the trade. The price of camphor oil (China) spot is US $ 2.90 (cif) (May 1990). It was us 4 2.80 per kg (in May 1990). Engonol fetched US $ 5.95 per kg (July 1989).

4.18: ARTEMISIA OIL

This is yet another plant found in Zanzibar having light green lobed leaves with high fragrance. The oil on distillation of the plant material has produced a blue oil (0.85%) having azulene.Oil has highly camphoraceous odour, closer to Artenisia absysthium (worm wood oil). The major component in camphor (25.4%) 4 - terpened (9.44%), geranylacetate (6.52%) caryophyllene (5.16%) linalool/thujone(3.65%) and engenol (2.76%) Some believe this plant could also be A. afra. The plant has to be properly identified. The oil has potential use as a substitute of worm wood oil in flavour use and for chamomila in cosmetics/perfumery.

The same strategy recommended for Ocimum is observed. Artimisia annua oil is used as a source of anti malarial durg and the leaves are used for making Fragrance industry.

4.19: It is recommended that in maximizing the utilization of the capacities of the Chake Chake distillery the following essential oil crops be taken for development in 1990 - 1992 period and the medium term to long term crops be considered for 1992-1995 period.

Crops recommended for 1990-1992 short term programme.

(a) Lemon grass

(b) Vetiver grass

(c) Citronella grass

(d) palmarosa grass

(e) Cimmamon

(f) Cardamom

(g) Ginger

(h) Black pepper

For the medium /long term beginning 1992-1995 the following crops be taken

(a) Geranium

(b) Nutmeg and MAce

(c) Patchouli

(d) Ylang - Ylang and Gananga

(e) Ocimum and Artemisia

5. THE METHODOLOGIES FOR STREAMLINING MARKETING PRACTICES:

In order to increase the capacity utilization of the Chake Chake Distillery it is necessary to

(a) Have product diversification within clove categody by producing derivatives;

(b) Undertake the crops recommended for development in the short term (1990-1992) and take up medium tern crops (1992-1995) following the phase 1.

It is recommendedthat strategy that should be adopted by the ZSTC before going national with the recommended crops is to

(a) Set up Agricultural consultative group under the General Manager headed by a full time local consultants to draw up implementation and follow up plans to these proposals. The area under spices and essential oil crops at Kizimbani be brought under the ZSTC supervised by the local consultants who whilst propagating planting material for Pemba would also oversee the work of the full time agronomist appointed to the farm under the distillery Manager, Pemba.

(b) Immediately appoint a full time qualified agronomist to be incharge of the nucleus farm at Chake Chake. He should be given three supervisory grades with agricultural background who can be trained on extension work among contract outgrowers of the distillery producing raw materials contracted for with the distillery;

(c) Establish a Necleus Plantation of Distillery and establish contract farmers growing crops on the basis ofthe outgrower concept. The advantages of this model of developemnt are:-

i. It will ensure that the distillery will have its own nucleus estate to feed the minimum raw material requirement;

ii. It would enable encouraging willing outgrowers who are willing to join the project asc ontract farmers to grow crops, acreage agreed with the distillery at prices to be paid delivered at the farm gate or at ex-factory.

iii. It would concentrate the growing of crops needed within a controlable range of lans;

iv. It would build linkages with production, processing and marketing and no guilt in supply will arise because average growth can be controlled tc meet distillation demand;

v. It will help the distillery to became self sustained in its own supply of raw materials without wide variations in supplies nad plan production programmes to meet the actual export plans and targets;

iv. It will enable linkages with Kilimo regarding research, pest and disease control, farmer education and extention based on market intelligence;

vii. it will encourage controlled diversification based on market demand;

viii. it would reduce the dependance on Kilimo who seems to be engaged otherwise with food crops and livestock;

ix. It could ensure cost control and minimize transport since prices could be fixed ex factory;

x. Credit for production couldbe arranged through the branches fo the People's Bank of Zanzibar or Tanzanian Cooperative Bank without resorting to disbursing ZSTC funds;

xi. it will bring about healthy development to the agriculture and land use scenario in Pemba island;

xii. It is now the pattern throughout the world for distilleries to have their own nucleus plantation of essential oil crops;

xiii. it will build up necessary expertise with ZSTC enabling quality of human resources to improve;

xiv. The distillery could undertake its own technological research without awaiting academic oriented R.D. to complete as was the case with lemon grass oil where the distillery manager with information from technical literature, made it possible to use the distillery for distilling wild lemon grass for oil through his own initiative when the University of Tanzania at Dar es salaam wanted large funds to get on expert for the same purpose.

In order to streamline marketing practices for existing commodities plus the new prospective commodities, the export has suggest certain strategies in the earlier section. Accordingly, there is a need to carve out market into four geographical areas and appoint sole agent for all ZSTC products based on the criteria suggested. The four geographical areas are the EEC, the Americans. The far East and Oceania and the Gulf, Asia nad Eastern Europe including the USSR. The ZSTC marketing division is to service direct purchases and the Africa markets, with recommended training, provision of necessary technical and managerial information and services. The promotional material and other back up services vital to attain the marketing and sales strategies are chaked out.

A vital pre-requisite for successful marketing of essential oils and any spices oleoresins is a thorough understanding of the channels and prodecures by which the products pass from distiller to end-user; this is as important as awareness of which the size and breakdown of the market. There has been several instances of production ventures failing thrpugh a faulty understanding of, or dissregard for the market's mode of operation.

The need for the ZSTC to establish and maintain a regular flow of communication with prospective and users or at least with the intermediaries ie. dealers, export houses of agent-brokers, through who it must intend to market the products, cannot be over-emphasized. A producer like Zanzibar attempting to distil a known oil like clove oils in an untried location, or even to existing production appreicably, must ensure from the outset that a sufficient number of prospective purchasers welcome or

at least are positively inclined towards the scheme. Assuming that this condition is satisfied, ZSTC must ascertain that it can supply the ppropriate qualities in adequate quantities, in suitable packaging, at the right time, and in accordance with accepted quality standards and specifications. Correct documentation procedures for payment are of vital importance and have to be firmly agreed in advance and adhieved to vigorously. The marketing division of the ZSTC should utilize the telex, fax machine or even telephone and through correspondence to maintain contacts without postponing and neglecting replies.

A business like approach than at present is required for lasting success for Trading and marketing Zanzibar essential oils. The Number of participants in the essential oils trade remains considerable despite the reduction of intermediaries and an increase in trading between producers and processors of end users. Some countries like the U.K., France, Germany and the USA regularly import more than they consume, to refine or re-refine for re-export as done at Grasse, France with many essential oils. The re-export Trade is important to minimize the effects of supply irregularities and demestic inbalances in supply and demand brought about by vagaries fo climate, crop-cycles, crop disease, inadvertent over-stocking or unexpected peaks in demand. Dealers frequently import the oils into their countries of operation and re-export to order as done by John Kelly in London with Zanzibar clove oils. In some cases importers clean, filter orfurther refine the oil or blended before reshipment as done for Indonesia oils or chinese oils. The basic marketing chain as applicable essential oils throughout most of the worls is illustratedbelow. The structure of the Japanese essential oil trade is slightly different.

Chart 3: Structure of the Western Trade in Essential oils and spice olearesus

Exporters

Enterpot

Commissioned broker or Agent

Dealers/Merchants

Commissioned Brokers or Agent

Processing or compounding Houses

End product Manufactures

Chart 4 : Structure of the Japanese Trade in Essential Oils and Spice oleoresins.

Producing Countries

Foreign Processors/Compounding Firms

JAPANESE IMPORTERS

Branches/Sale Agent in Japan

JAPANES PERFUME?FLAVOUR COMPOUND MANUFACTURES

DEALERS

SALES AGENTS

END - PRODUCT MANUFACTURERS

The structure of spice oleoresin trade is generally simpler than essential oils. Have direct trade between producer and user of intermediate processor is the rule. Dealership in oleoresin trade is an exception rather than the rule. The traditional brokers role has changed and they are now increasingly conduct business on behalf of exporters as their agents. Dealers like John Kelly in the U.K. who produce purchase Zanzibarian clove oils holds stock and sell produce in quantities the buyer require. Some large firms compounding or producing final products like Firmich in Switzerland by pass dealers and purchases directly from producers. It is now the usual practice of same purchasing staff of multinational processing and compounding firms, which increasingly dominate the trade, to travel frequently in order to negotiate direct agreements with producer/exporters. In this process, ZSTC should utilize the service of the Plant Manager of the distillery rather than depend in the staff of the ZSTC marketing staff who do not know the technicalities of the product they offer. Such buyers should be flown to the Pemba Distillery for them to see for themselves, first hand, the distillery at Pemba. Smaller firms rely on agents since they cannot afford to spend such an expense. Therefore, it is best that ZSTC agents should also be invited to visit the distillery at Pemba at least once. The largestfirms neverthe - less avail themselves of dealers services of urgent supplies or small, occasional orders. For most essential oils, trading may take place either on the futures or the spot market. The former involves an agreement on a firm price for delivery at a specified date, the latter concerns purchase from a merchant's existing stock. Higher prices are usually paid on the spot market because it is convenient and because of price mark-ups. Payment may be made against receipt of documents or within a specified number

of days after receipt of documents or as done by the ZSTC by a letter of credit.

The spice olearsin trade is roughly similar, however, this is less of a spot market and, given the much smaller number of parties involved, the use of the letter of credit is probably unusual.

The Japanese market has changed appreciably during the last two decades, imports of essential oils are strictly controlled by about five or six large specialized importing firms. The individual proccessors and users are freely buying at will especially after the liberalization of the trade.

Zanzibar should enter this market through direct contact by personal contact and better servicing the by the ZSTC. Many buyers continue to avail themselves of the services either of independent Japanese intermediaries, or perhaps more frequently, of local agent of overseas companies. It is worth ZSTC to use either avenues to intruce into the Japanese market.

The existing trading patterns and procedures work satisfactorily for most part and it is best ZSTC uses them for its advantage. Certain amount of flexibility in the trading and pricing practices may be considered by ZSTC regarding new essential oils.

Most essential oils continue to be shipped from the source in the standard 200 litre (45 imperial gallons) iron drum, typically containing approximately 100 kgms of oil. Expoxy-lining is common

for oils that are likely to react adversely with iron. In some cases, the drum may be constructed by heavy duty plarties. Lower volume oils may be shipped in smaller containers between 25 and 100 litres. Japanese buyers prefer to import essential oils in a wider range of container size than has so far been readily available. Some of the dealers and merchants break bulk by transfering oils from large standard containers like 220 litre drums into smaller ones to meet small orders. ZSTC could discuss with buyers and also supply smaller containers of essential oils.

Spice olearesins are mostly sold to processors in containers ranging from 1 kgms to 10-15 kgms. The smaller containers of 1 - 2 kgms are usually of glass or lined metal. The larger ones are of plastic and sometimes metal. Oleoresins produced in the USA are usually packed in plastic pails of 25 pounds. For large consignments, containers of 100-200 kgms are sometimes used.

The producer is responsible for ensuring that the containers, are correctly sealed have adequate air-space between the oil surface and the ton of the container. They should be properly labelled., giving product name, date of manufacture, batch and lot number, country of origin, mett weight and oil specs.

It is best of ZSTC follows the norms for packaging and labelling laid down by the I S O. the reputation of ZSTC must be maintained as a supplier, of clean oil with no impurities:

ZSTC should closely workwith numerous international bodies dealing with essential oils such as the Flavour and Extract Manufacturers Association (FEMA) in the USA and the International Federation of Essential oils and Aroma Trades (I F E A T) based in London. ZSTC should also note the details of safety regulations within the EEC for dangerous 'substances' of essential oils and spice olearesins as laid down in EEC council Directive of 79/831/EEC (The famous 6th ammendment) and the Council Directive 88/379related to the classification, packaging ald labelling of dangerous preparations. Risk of essential oils and oleoresins is their flammability, taxicity, corrosity/ irritating properties etc., requirement for the transport of dangerous goods differ according to their conveyance. Details as per IMDB (sea) + IATA - DGR - ICAO-TI (Air) are particular importance to exporters like ZSTC to EEC.

At a time when many natural essential oils are under growing pressure from cheaper synthetics, the importance of maintaining regularity of supplies and quality, and of scrupulous adherance to delivery dates and agreed contractural procedures, has never been greater. This must be solemnly followed by the marketing division of the ZSTC.

ANNEXES

1. Zanzibar - Clove Growing Area (A) and Soil, Climatic Maps.
   - Collecting Centres ZSTC (B) Godowns ZSTC (C)

2. Zanzibar - Production, Collection, Exports of Clove and Clove Product.

3. Present Status of the ZSTC

4. Flow Chart - Marketing Channels and Flow

5. **Price List of Selected Essential Oils**

6. List of International Standards of Essential Oils

7. **Zanzibar - Price Trends of Clove Oil Exports**

8. List of Reputable Importers and Users

9. Users and Sources of Market Information on Essential Oils.

10. List of Persons met during the Mission.

11. List of Publications Recommended for ZSTC Marketing Division.

12. List of Institution from which Selected Planting Materials of Essential Oils can be obtained.

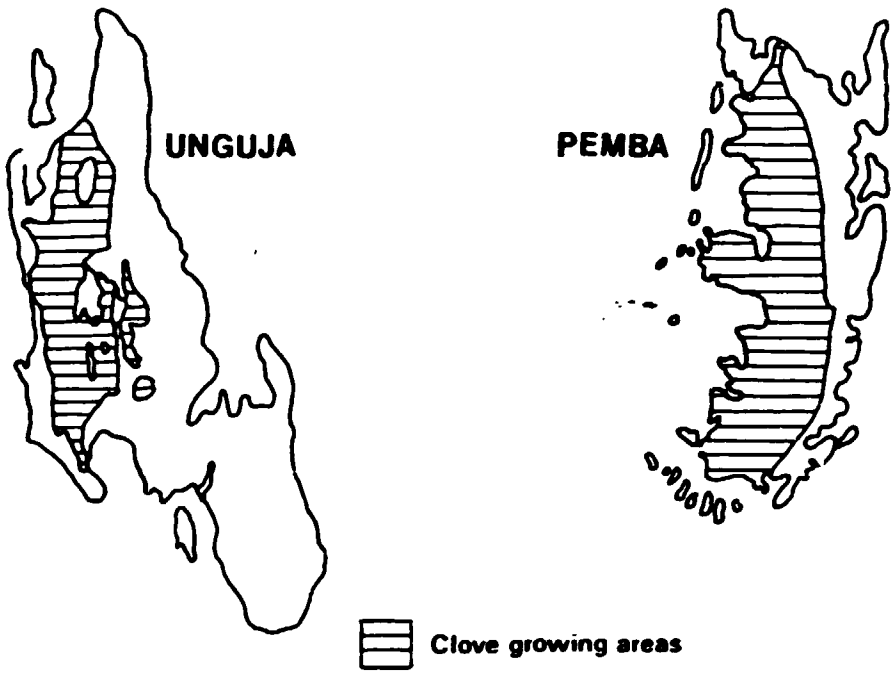
13. References

14. **Job Description of the UNIDO marketing expert**

MAP-1

Annex I

THE DISTRIBUTION OF CLOVE GROWING AREAS AN UNGUJA AND PEMBA



MAP–2

SOIL TYPES IN PEMBA

PEMBA ISLAND

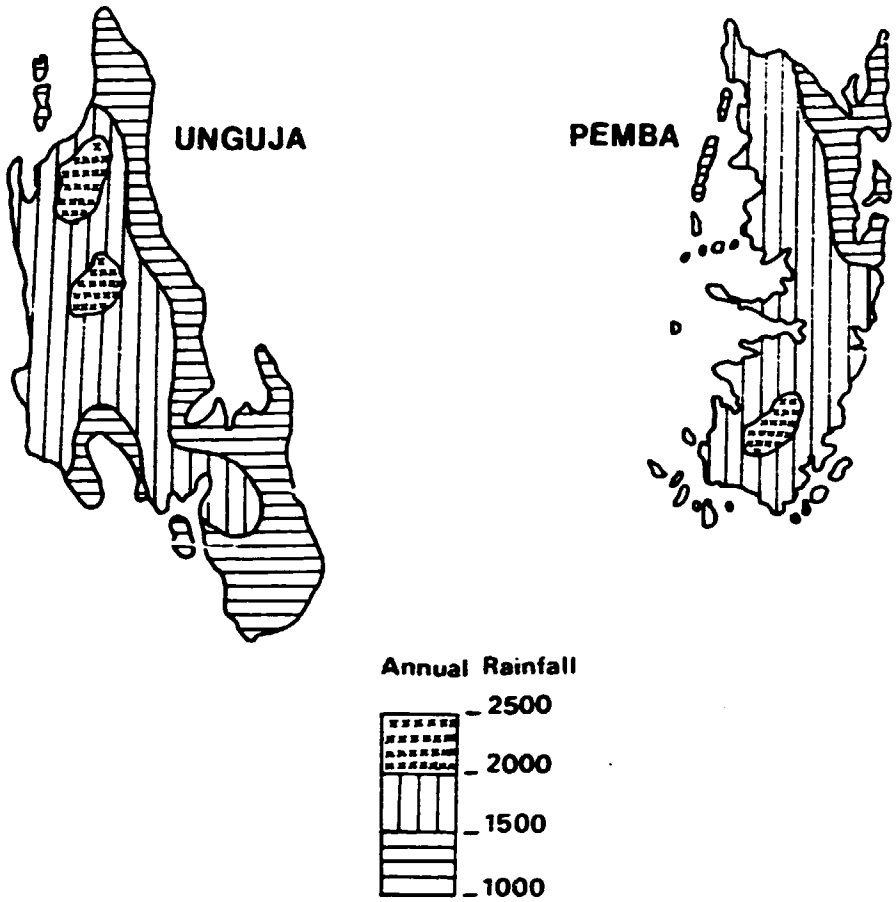
SOIL TYPES

- Utasi Soils
- Semi Utasi Soils
- Bopwe Soils
- Mtifutifu Soils
- Ndamba Soils
- Kinako Soils
- Makaani Soils

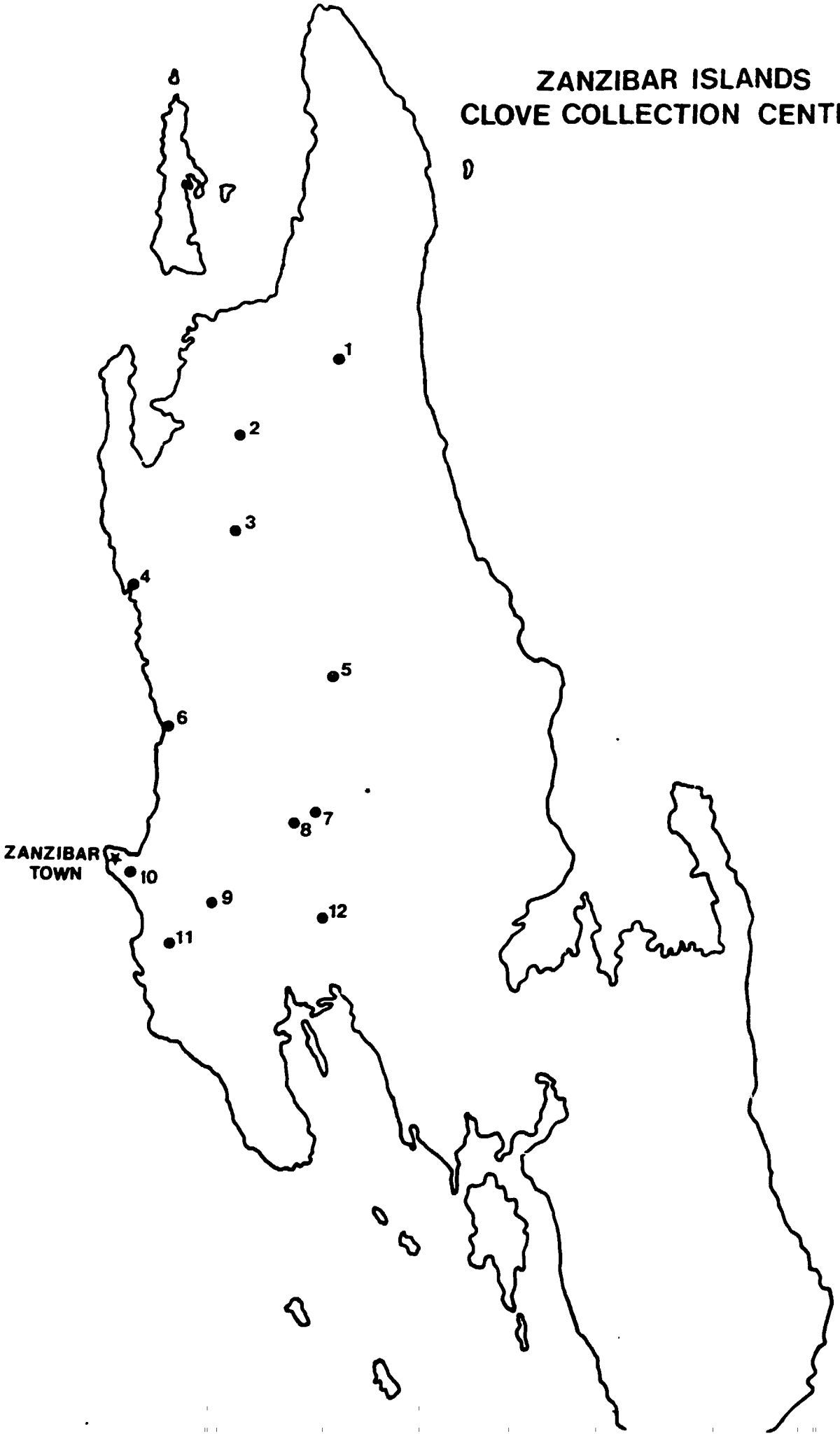
Source: FAO/IFAD, 1987

MAP-3

RAINFALL IN UNGUJA AND PEMBA



ZANZIBAR ISLANDS
CLOVE COLLECTION CENTRES

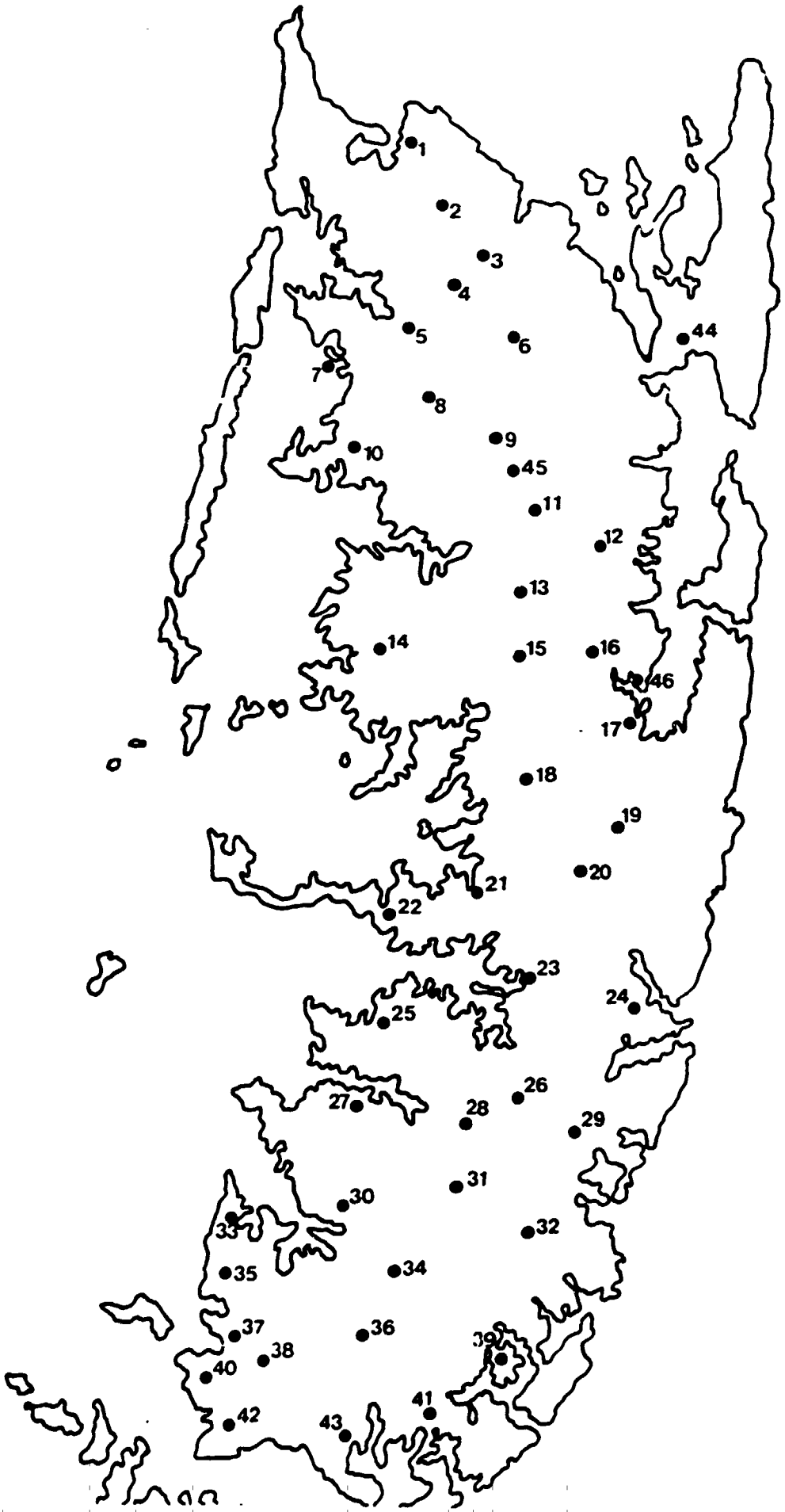


MAP 4

1. GAMBA
2. DONGE
3. MAHONDA
4. KIOMBA MVUA
5. KIBOJE
6. BUBUBE
7. KOANI
8. MWERA
9. FUONI
10. SAATENT
11. K/SAMAKI
12. JUMBI

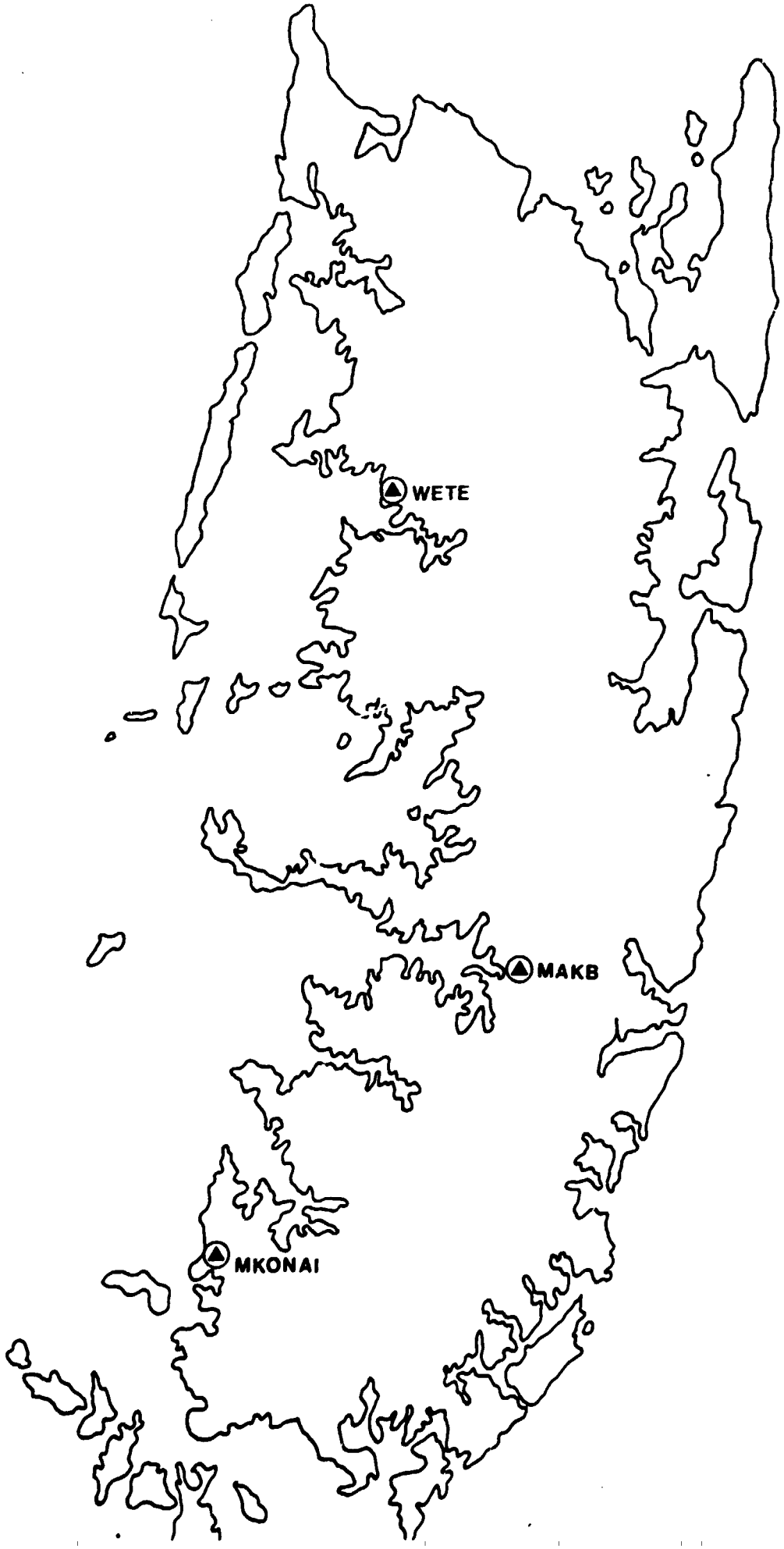
PEMBA ISLAND
CLOVE COLLECTION CENTRES

MAP - 5



MAP 5

1. Msuka
2. Konde
3. Kinowe
4. Chimba
5. Mgogoni
6. Sh/Vyamboni
7. Jurguni
8. Kinyasini
9. Kisiwani
10. Raha
11. Pandani
12. Shegenjuu
13. Mzambarauni
14. Miambwe
15. Piki
16. M/Mdogo
17. Kinya
18. Ziwani
19. Ole
20. Ngambwa
21. Kwale
22. Ngagoni
23. Chake
24. Wawi
25. Kilindi
26. Chanjamjawiri
27. Mgelema
28. Chonga
29. Pujini
30. Wambaa
31. Ngwachani
32. Chambani
33. Makambeni
34. Mizingani
35. Mkoani
36. Mfambile
37. Shindi
38. Mkanyageni
39. Kiwani
40. Michezani
41. Kengeja
42. Chokocho
43. Kangani
44. Wimbwi
45. Finya
46. Kambini


WETE
MAKB
MKONAI

ZANZIBAR : EXPORTS OF CLOVE AND CLOVE OIL

CLOVE BUD ; EXP. CRTS	TONS	US$
1984/85	8927.73	34,608,252.60
1985/86	6105.849	20,839,856.35
1986/87	3018.60	11,066,150.00
1987/88	3204.33	10,071,038.40
1988/89	5314.278	11,050,520.06
1989/90	12267.00	24,908,650.60

SOURCE; ZSTC. STATISTICAL DIVISION
(FINANCIAL YEAR JUNE/JULY)

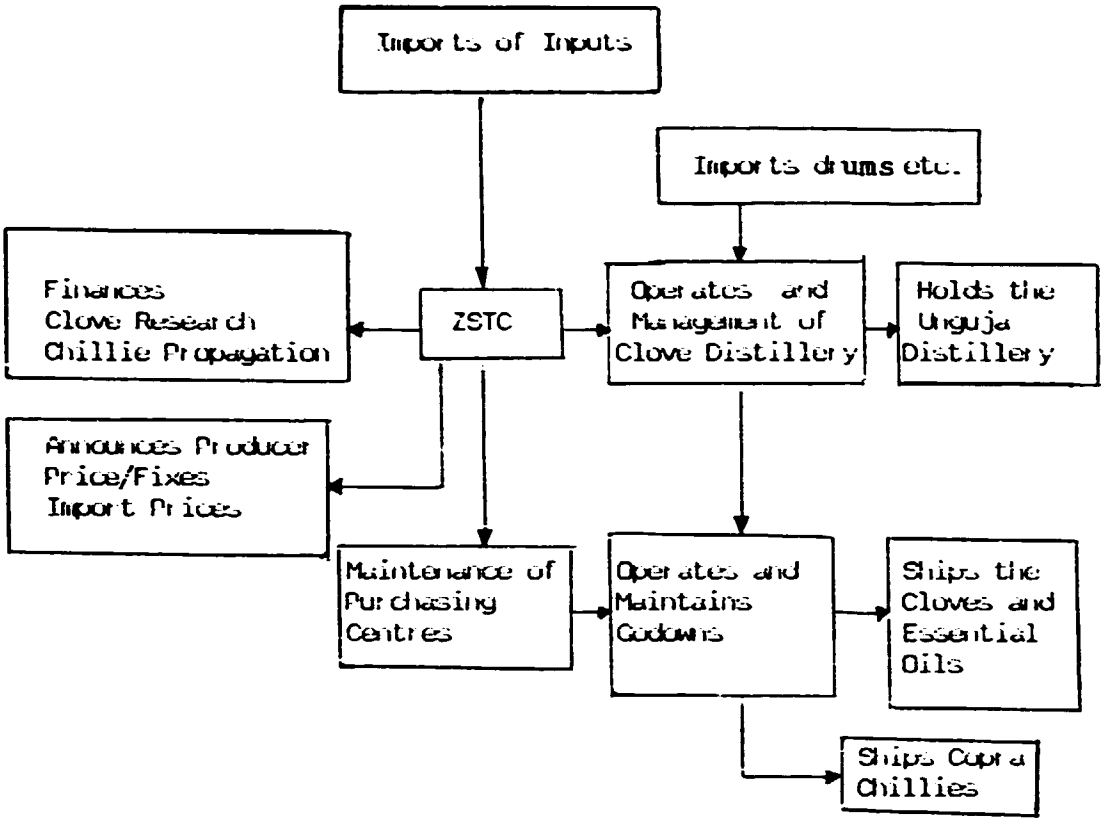
CLOVE STEM OIL EXP CRTS	TONS	US$	$ UNIT PRICE
1984/85	24.0	146,400	6100
1985/86	-	-	-
1986/87	3.74	233.32	6238.50
1987/88	7.06	52140	7385.27
1988/89	22.00	95700	4950.00
1989/90	39.82	206,030	5174.03

CLOVE BUD OIL; EXP. CRTS

1984/85	-	-	-
1985/86	-	-	-
1986/87	-	-	-
1987/88	-	-	-
1988/89	1.98	16830	8500.00
1989/90	1.54	14606	9484.40

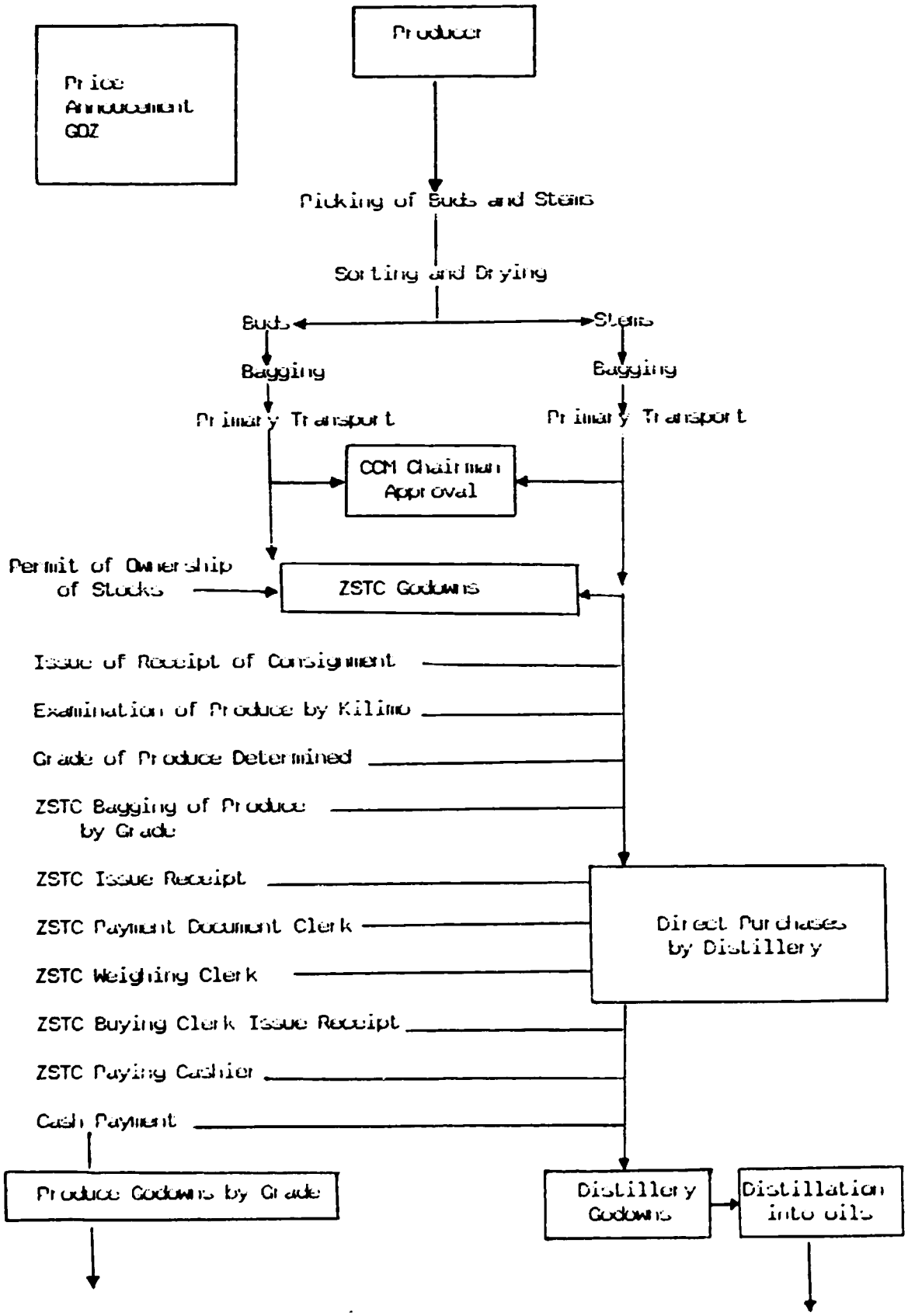
SOURCE ; ZSTC STATISTICAL DIVISION
(FINANCIAL YEAR JUNE/JULY)

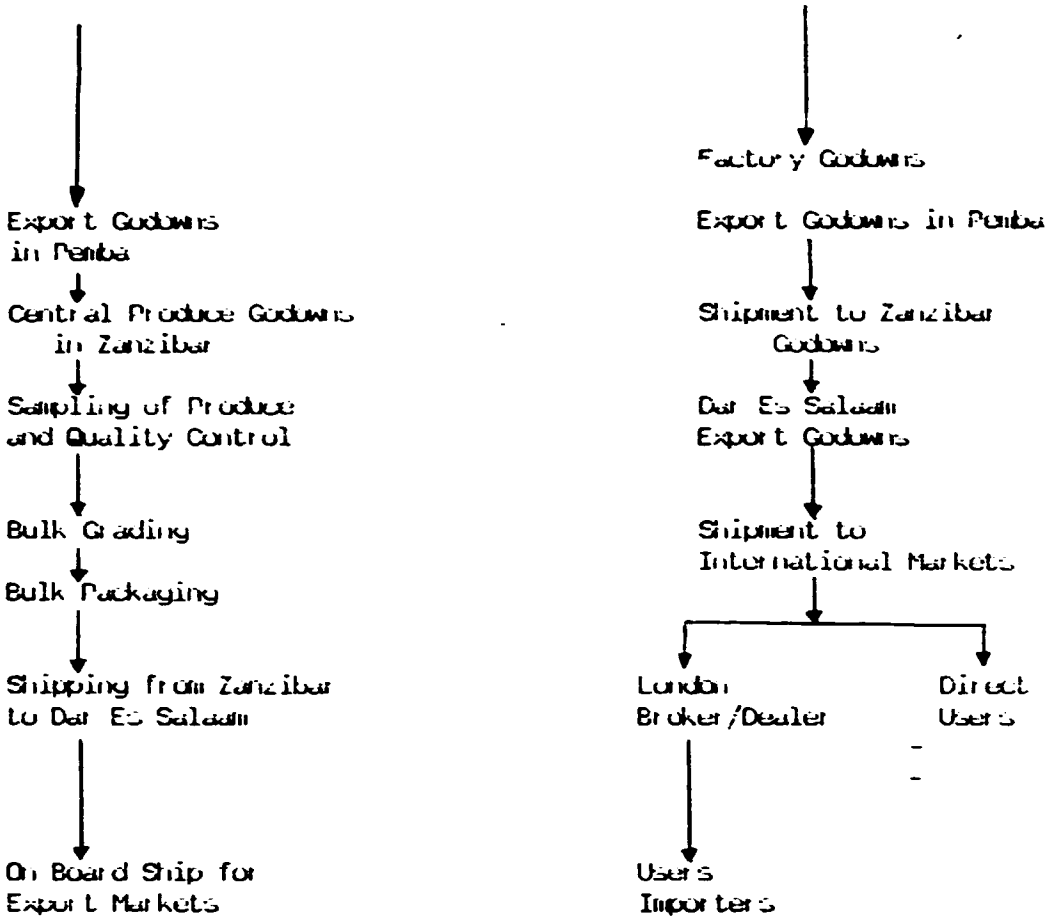
Present Status of ZSTC



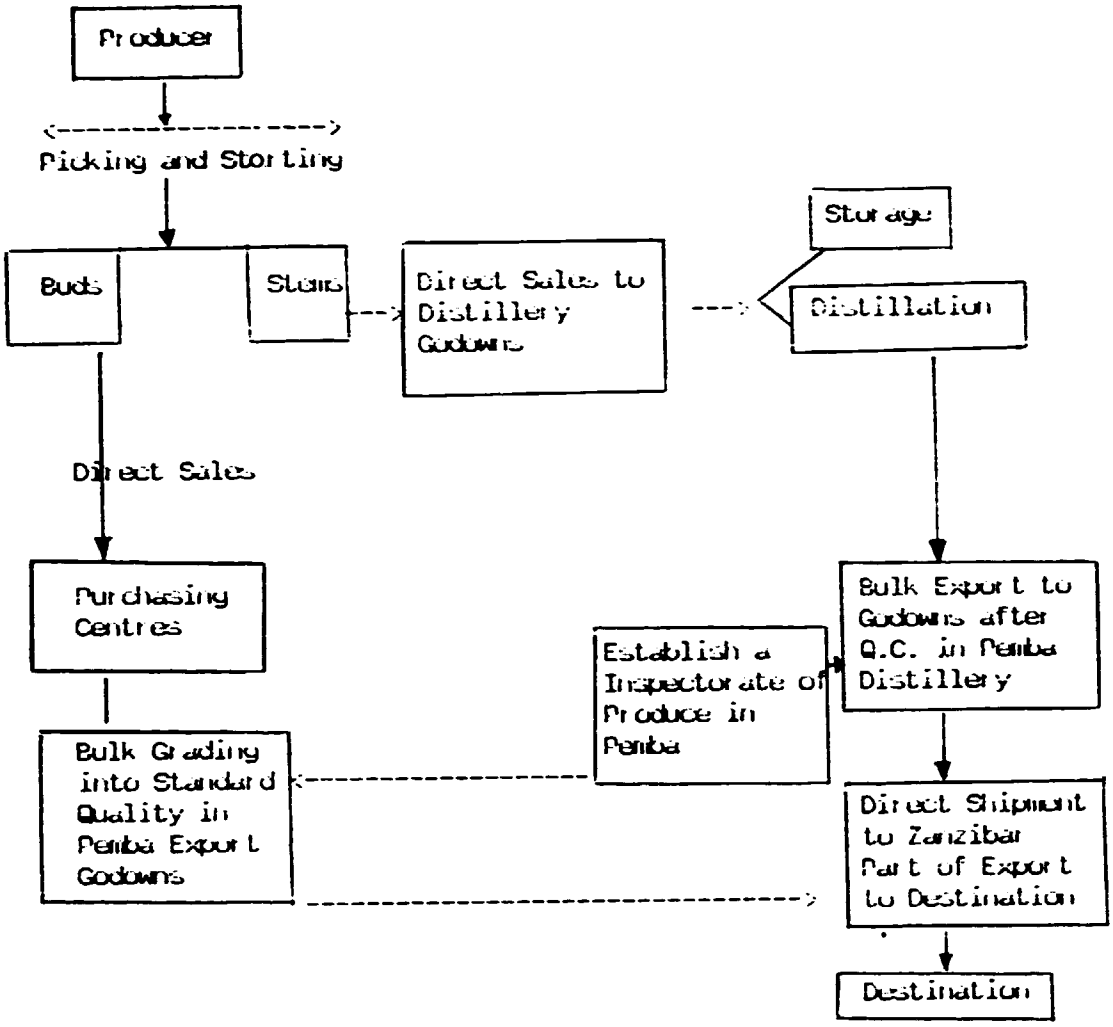
Annex IV

ZANZIBAR : Marketing Flow of Cloves and Clove Derivatives




Export Godowns
in Pemba
Central Produce Godowns
in Zanzibar
Sampling of Produce
and Quality Control
Bulk Grading
Bulk Packaging
Shipping from Zanzibar
to Dar Es Salaam
On Board Ship for
Export Markets
Factory Godowns
Export Godowns in Pemba
Shipment to Zanzibar
Godowns
Dar Es Salaam
Export Godowns
Shipment to
International Markets
London
Broker/Dealer
Direct
Users
Users
Importers

Marketing Flow
Recommended System



List of Standards Issued by the International Organization for Standardization (ISO) on Selected Essential Oils

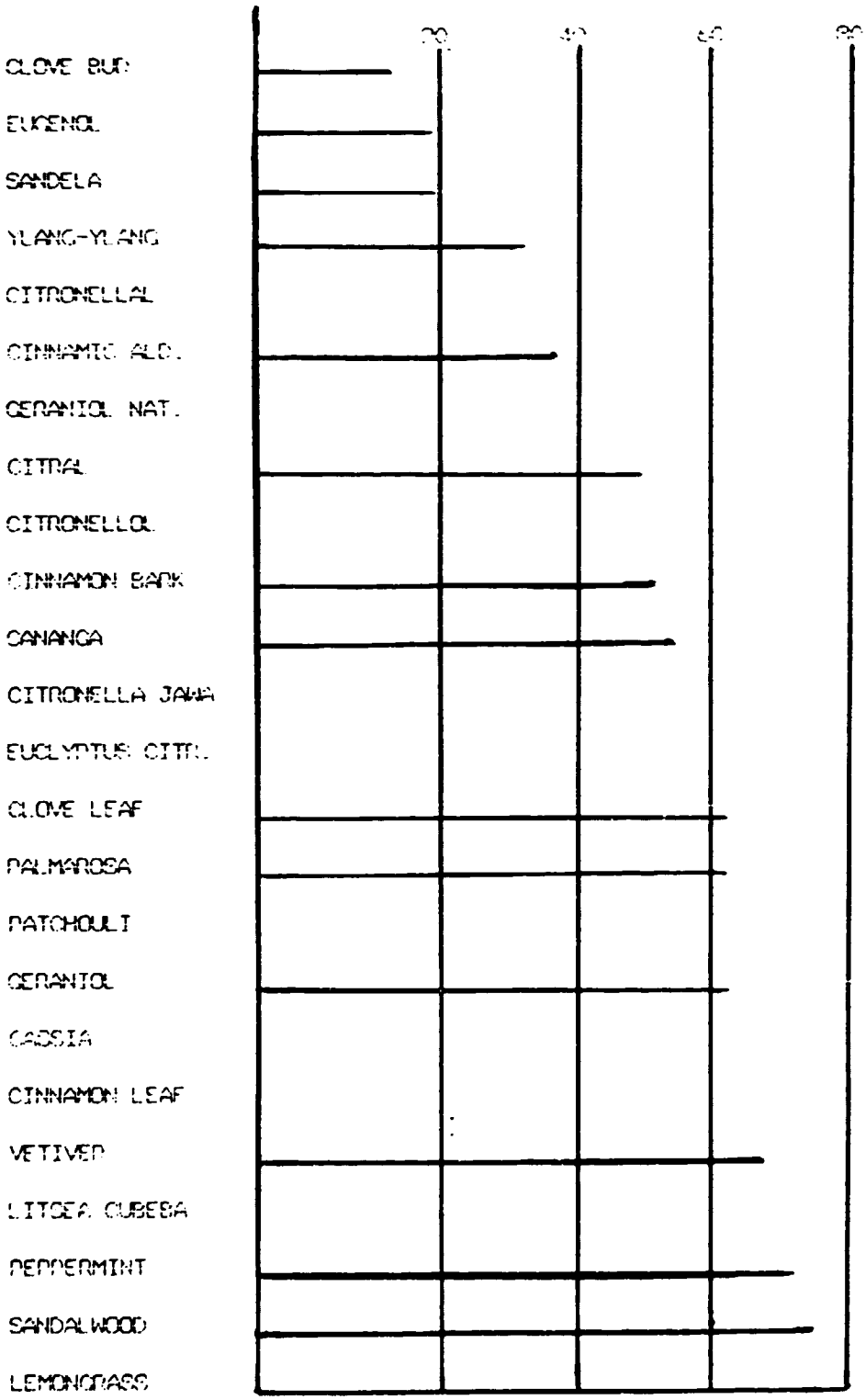
Reference	Ed.	Page	Title	
ISO/R.210-1961			1	Essential Oils - Packing
ISO/R.211-1961			1	Essential Oils - Labelling and Marking Containers.
ISO/	212-1973		2	Essential Oils-Sampling
ISO	279-1981		2	Essential Oils- Determination of relative density at 20°C (Reference method)
ISO	280-1976		2	Essential Oils- Determination of relative index.
ISO	358-1977		1	Essential Oils Preparation of test samples.
ISO	592-1981		2	Essential Oils Determination of Optical rotation.
ISO	703-1980		2	Essential Oils Determination of ester value.
ISO	875-1981		3	Essential Oils Evaluation of miscibility in ethand.
ISO	1041-1973		2	Essential Oils Determination of Freezing point.
ISO	1202-1981		3	Essential Oils Determination of 1.8 Cineole content.
ISO	1241-1980		3	Essential Oils Determination of ester value after acetylation and evaluation of free alcohols and total alcohols content.

ISO 1242-1073	2	Essential Oils Determination of acid value.
ISO 1272-1973	2	Essential Oils Determination of phenols content.
ISO 3042-1975	1	Oil of **pimento** berry.
ISO 3044-1974	2	Oil of Eucalyptus Citriodora.
ISO 3045-1975	1	Oil of bay
ISO 3061-1979	2	Oil of black pepper.
ISO 3063-1083	2	Oils of ylang ylang (Canaga odorate (Lamark) J.D. Hooker and Thomsanil)
ISO 3065-1974	2	Oil of Australian Eucalyptus. 80-85% cineole content.
ISO 3141-1975	1	Oil of Clove leaf.
ISO 3142-1974	1	Oil of clove bud.
ISO 3143-1975	1	Oil of clove stem.
ISO 3215-1974	1	Oil of nutmeg.
ISO 3217-1974	2	Oil of Lemongrass (Cymbopogon citratus)
ISO 3218-1976	2	Essential Oils-Principals of nomenclature.
ISO 3219-1976	2	Oil of lime-obtained by distillation.
ISO 3523-1976	2	Oil of Canaga
ISO 3524-1977	2	Oil of cinnamon leaf.
ISO 3757-1978	2	Oil of patchouli.
ISO 3793-1976	2	Essential oils-Estimation of primary and secondary free alcohols content by acetylation in pyridine.

ISO	3794-1976	2	Essential oils (containing tertiary alcohols). Estimation of free alcohols content by determination of ester value after acetylation.
ISO	3848-1976	2	Oil of Java citronella.
ISO	3849-1981	2	Oil of Ceylon citronella.
ISO	4096-1978	2	Essential oils (containing tertiary alcohols)Evaluation of free alcohols content by determination of ester value of after cold formulation.
ISO	4715-1978	2	Essential Oils-Quantitative evaluation of residence on evaporation.
ISO	4718-1981	2	Oil of Lemongrass (Cymbopogon flexuosus)
ISO	4729-1984	2	Oil of pimento leaf (Pimenta diacia(Linnaeus) Metrill)
ISO	4731-1978	3	Oil of geranium.
ISO	4732-1983	2	Rectified oil of Euclyptus globulus Labillardiere, Portugal.
ISO	4733-1981	2	Oil of cardamon.
ISO	4734-1981	2	Oil of mace.
ISO	5991-1979	3	Essential oils-Determination of
ISO	7661-1983	2	under reduced pressure Essential oils -Deter

Source : International Organization for Standardization (ISO) Geneva, Switzerland.

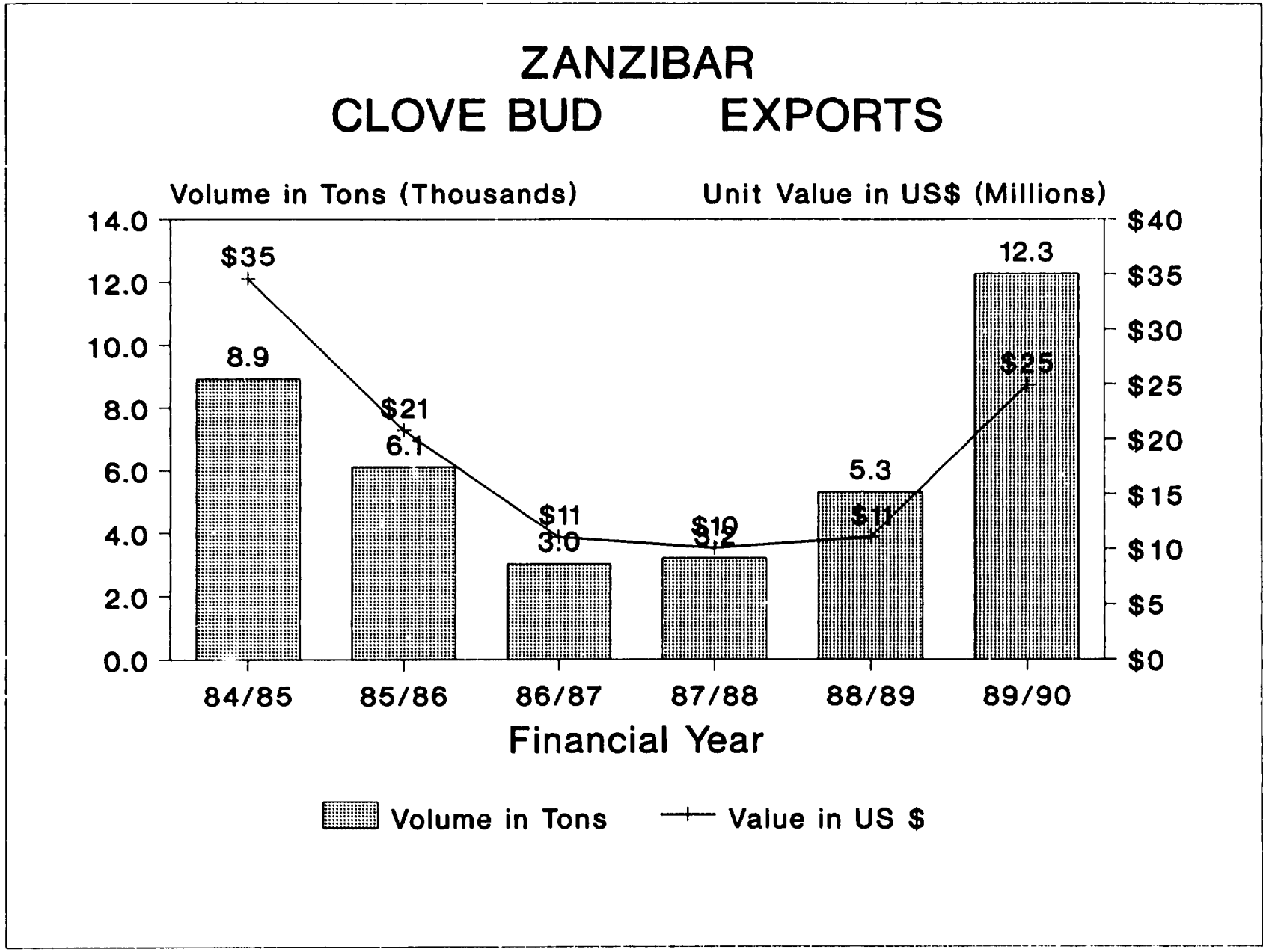
PRICE FLUCTUATIONS OF SELECTED ESSENTIAL OILS AND AROMA CHEMICALS 1977 - 1988
(Maximum price difference as percentage of highest price)



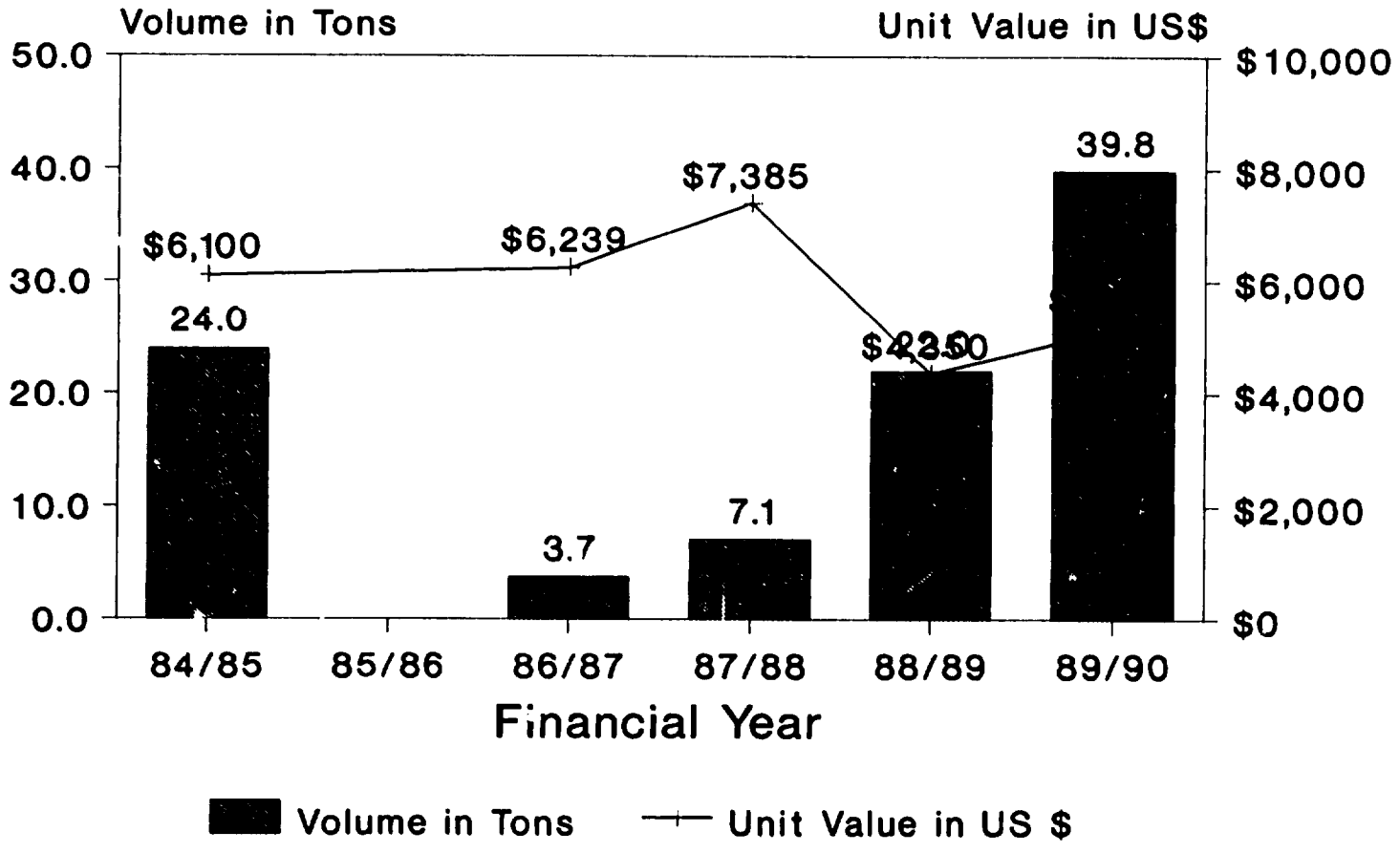
MARKET PRICES OF SELECTED ESSENTIAL OILS
(QUOTED IN US$/KG)

TYPE OF ESSENTIAL OIL	DEC. 1987	APRIL/ MAY 1988	OCT. 1988	FEB. 1989	MAY/ JULY 1989	MAY 1990
BASIL	-	-	-	-	92.00	-
BAY LEAF	-	-	-	-	35.70	52.00
CINNAMON BARK	-	-	-	-	528.00	-
CARDAMOM	-	-	-	-	77.00	500.00
CAMPHOR	2.65	-	2.60	3.10	4.40- 8.25	2.90
CLOVE LEAF	2.20- 2.47	2.25- 2.43	2.07- 2.02	1.90- 2.02	2.40- 16.00	3.00- 3.00
CLOVE BUD	-	-	-	-	24.00	-
CLOVE STEM	-	-	-	-	-	-
CITRONELLA	8.50- 12.50	9.70-11.25	8.50- 9.50	6.35- 7.00	5.05	4.30- 6.00
CINNAMON LEAF	8.80	-	8.80	9.00	10.50- 11.50	16.70-17.70
CASSIA	28.00	-	NNG	NNG	37.10	45.00
EUCALYPTUS	7.55- 10.00	5.00- 9.72	4.25- 9.00	8.75-10.25	8.75- 9.00	7.50- 8.60
GERANIUM	43.50	43.50	36.00	29.00	35.00- 42.00	28.50-36.10
GINGER	-	-	-	-	35.00- 52.50	46.50-92.50
LEMON GRASS	13.50	13.50	13.65	13.50	7.00- 14.00	16.50-17.40
LEMON	-	-	NNG	NNG	13.99- 16.50	15.00
LIME	14.33	-	NNG	NNG	19.00- 24.00	22.00
LITSEA CUBEBA	12.00	-	15.50	16.50	-	4.00
MINT	-	-	-	-	26.00	19.00-26.00
NEROLI	-	-	-	-	2100.00	-
NUTMEG	20.00	-	29.00	23.50	18.50	26.40
MACE	-	-	-	-	-	-
ORANGE OIL, BITTER	15.00	-	14.05	16.50	31.00	30.00-31.00
ORANGE OIL, SWEET	1.15	-	2.50	2.00	0.95- 1.00	-
PALMAROSA	30.00- 42.00	28.00- 35.00	28.00-41.00	25.00-33.00	48.00	33.50
PATCHOULI	18.00	21.50	11.50	18.50	18.00	19.00-22.00
PEPPER	-	-	-	-	36.00	-
PIMENTO	-	-	-	40.00	40.00	47.00
VETIVER	32.00- 46.00	38.00- 54.00	36.00- 58.00	38.50-52.00	24.00-58.00	45.30
YLANG YLANG	1755.50-322.50	1448.40-42216.00	1724.90-37427.00		600.00	
CANANGA	26.00	25.50	28.00	28.50	36.20	27.30
PEPPERMINT	7.00- 9.60	8.90- 10.00	16.00-17.50	18.00-21.00	-	18.70-21.00
VANILLA	16.00	16.70	15.50	14.75	-	-
VETIVERYL ACETATE	-	-	-	-	160.00	-
EUGENOL	-	-	-	-	6.95	

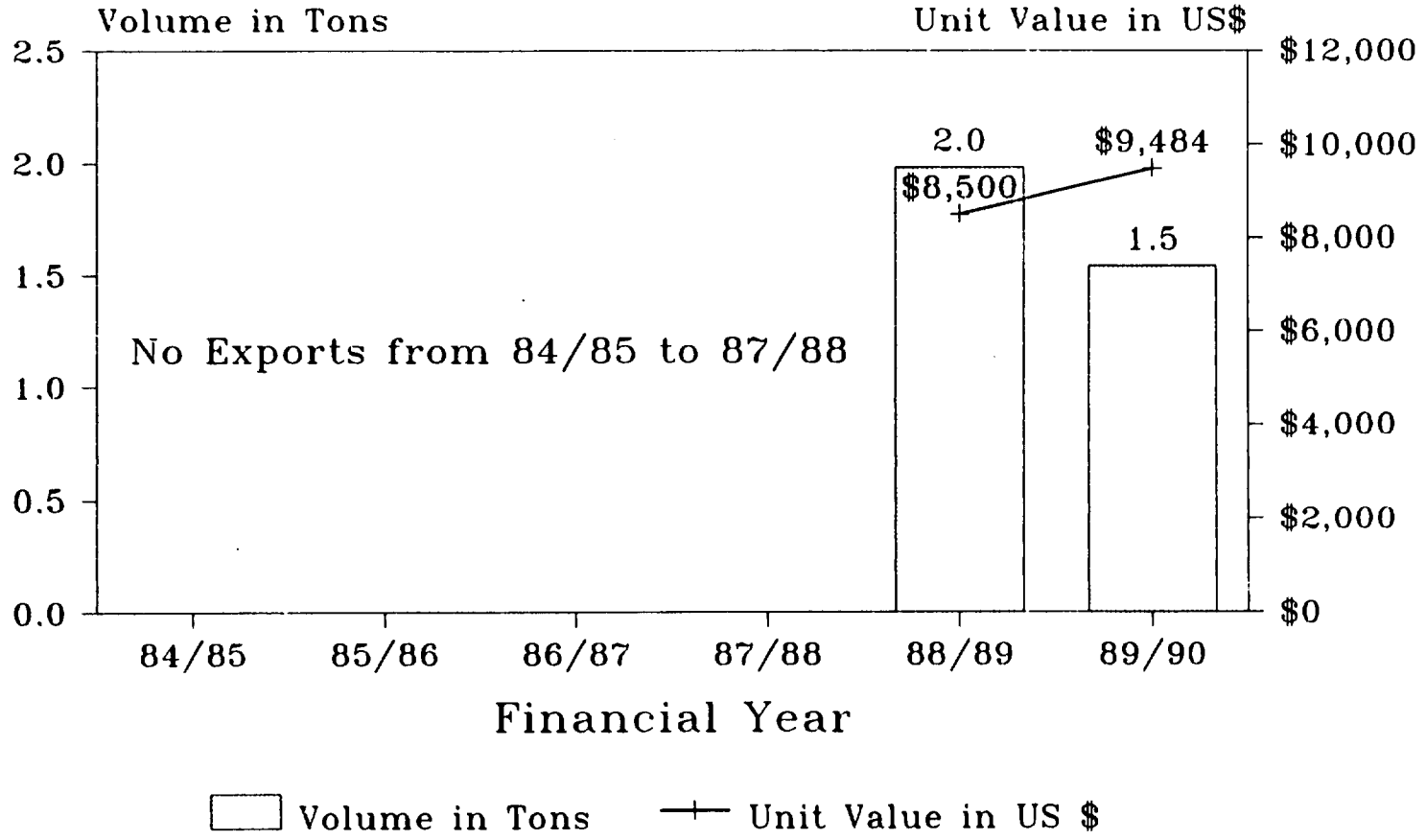
SOURCES ; PUBLIC LEDGER, FOREST DAY LARSON MARKET REPORT
BL SCOTT & CO. MARKET REPORT, CHEMICAL MARKETING REPORT


ZANZIBAR
CLOVE BUD EXPORTS
Volume in Tons (Thousands)
Unit Value in US$ (Millions)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
$40
$35
$30
$25
$20
$15
$10
$5
$0
$35
$21
$11
$19
$11
$25
8.9
6.1
3.0
3.2
5.3
12.3
84/85
85/86
86/87
87/88
88/89
89/90
Financial Year
Volume in Tons
Value in US $

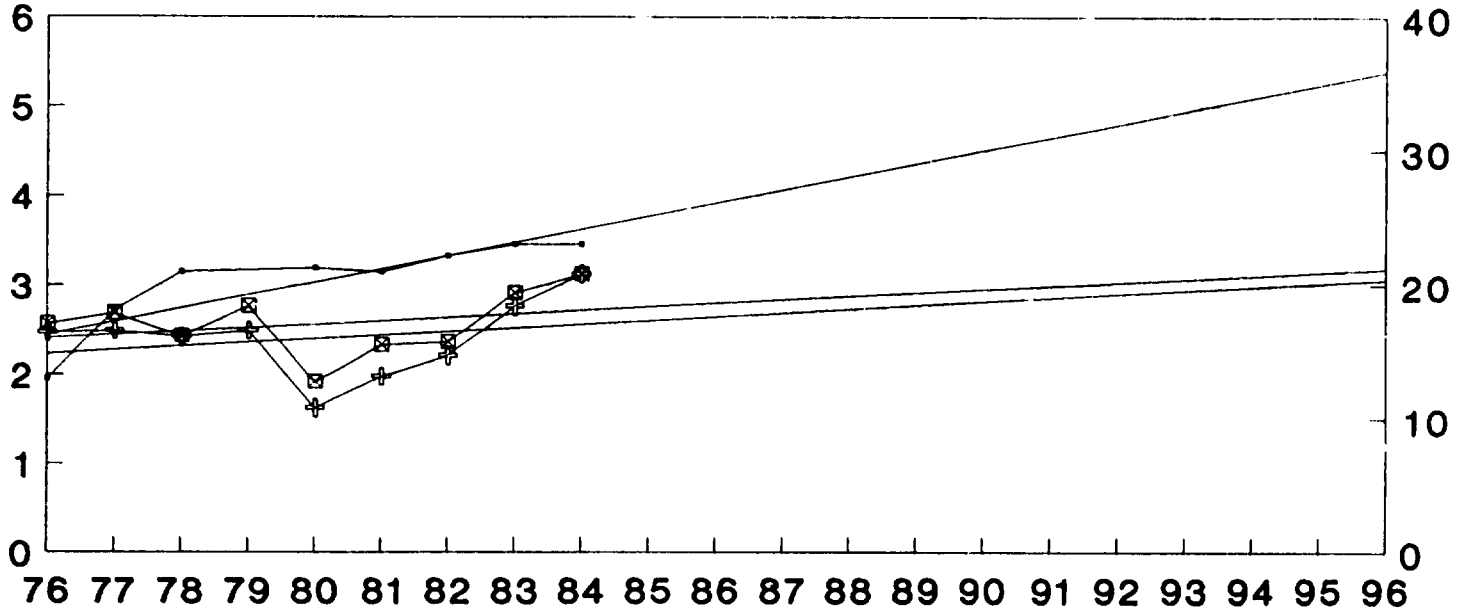
ZANZIBAR
EXPORTS OF CLOVE STEM OIL



ZANZIBAR
CLOVE BUD OIL EXPORTS



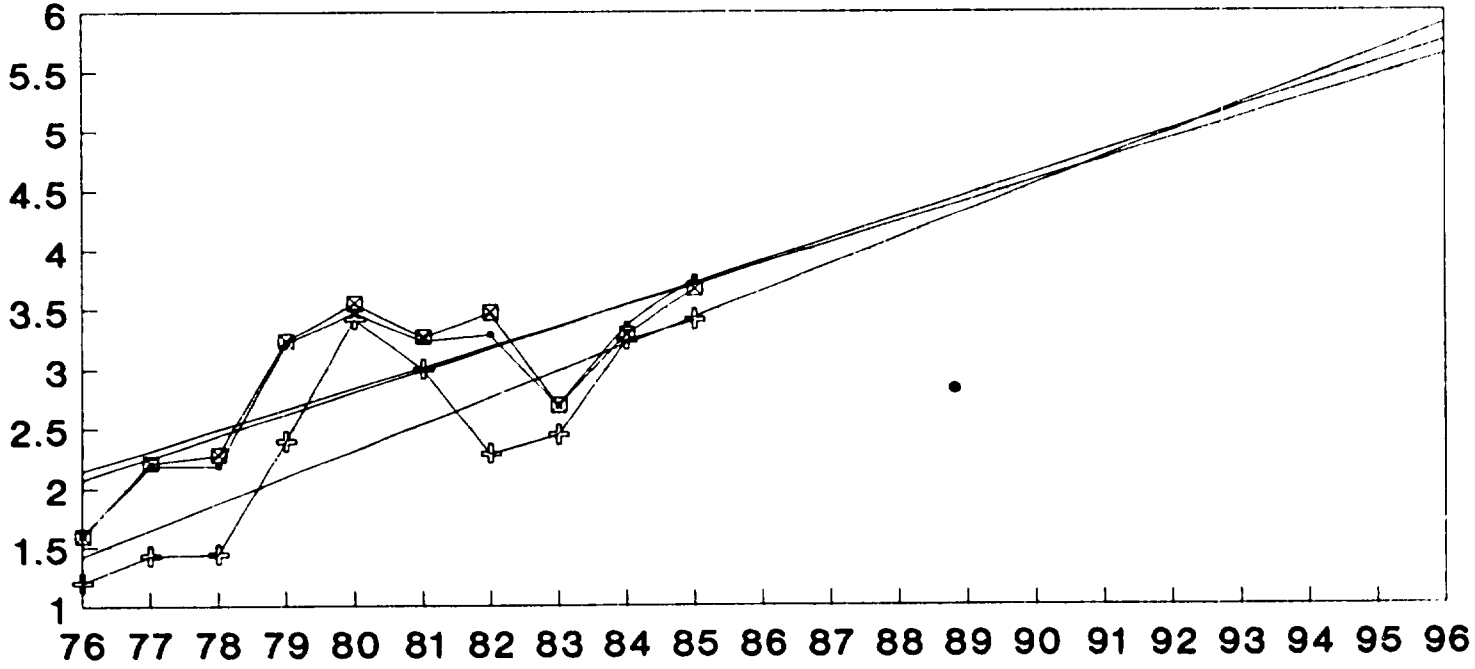
Clove Leaf and Clove Bud oils
Annual average prices
(Pounds sterling per Kg. C.I.F. UK)



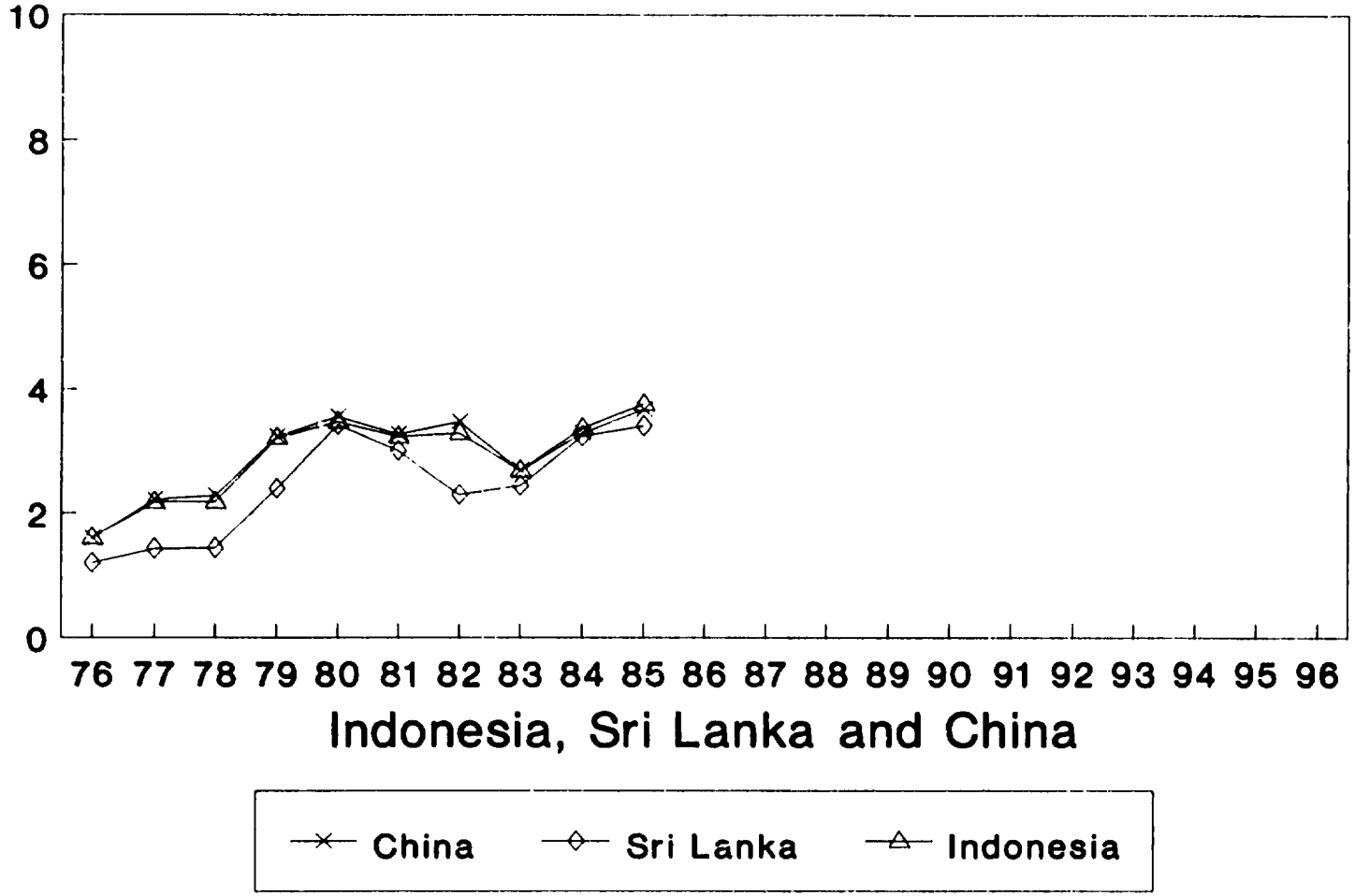
Indonesia and Madagascar

Leaf Oil, Madagascar
Leaf Oil, Indonesia
Bud Oil origin Unsta
Trend for Madagascar
Trend for Indonesia
Trend for Bud Oil

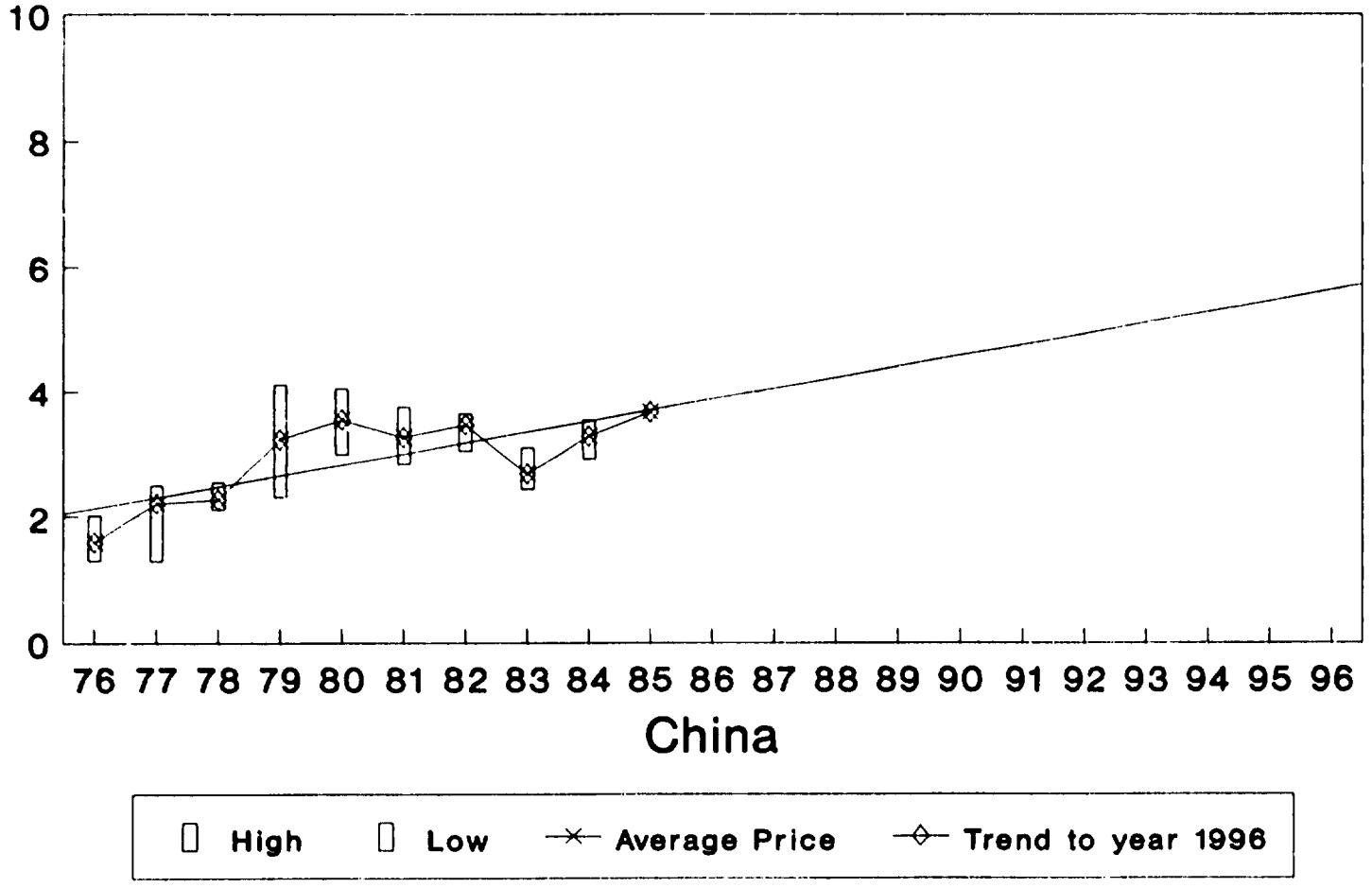
Citronella Oil - Annual Average Price
In Pounds sterling per Kg.



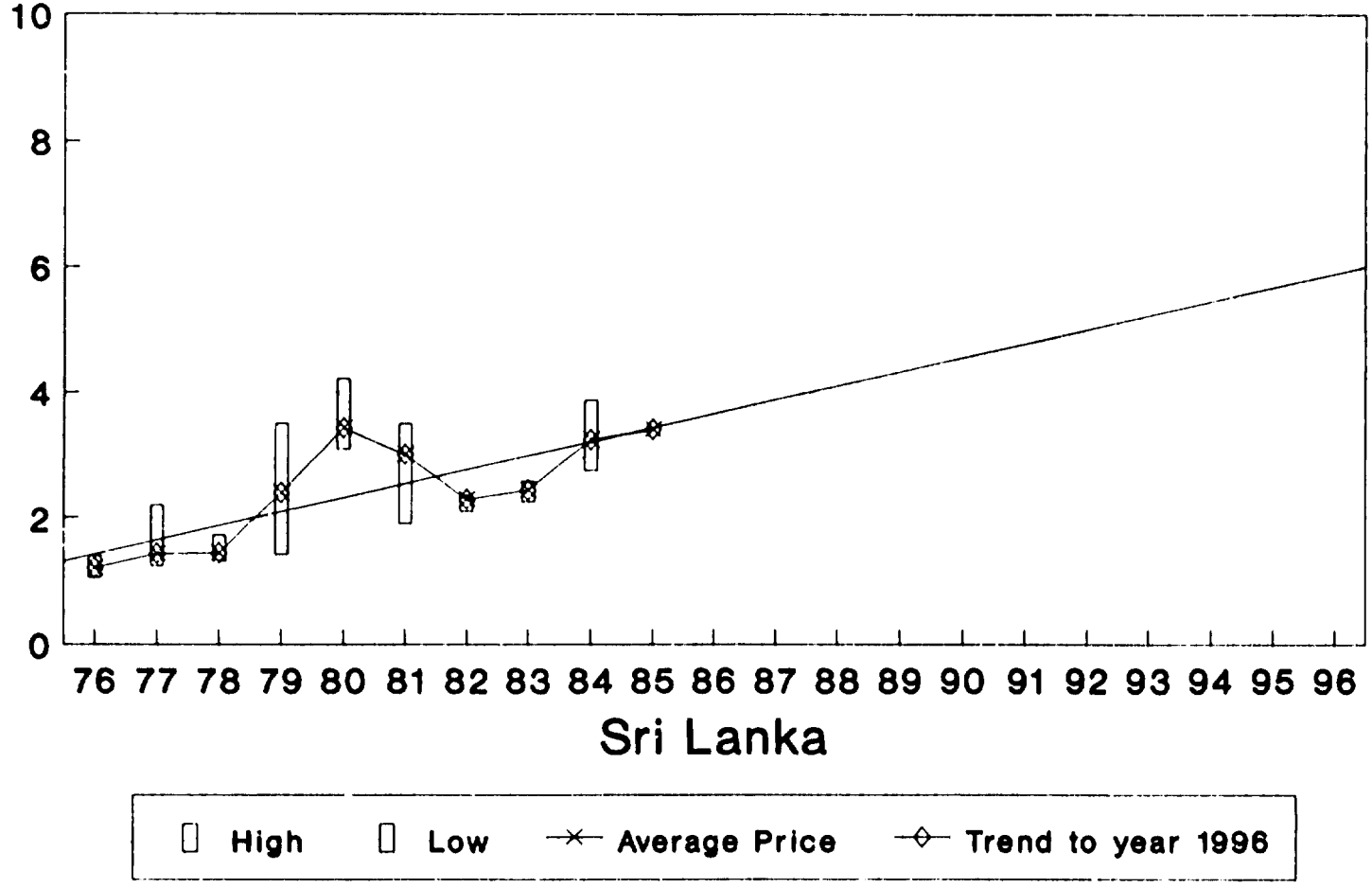
Citronella Oil - Annual Average Price
In Pounds sterling per Kg.



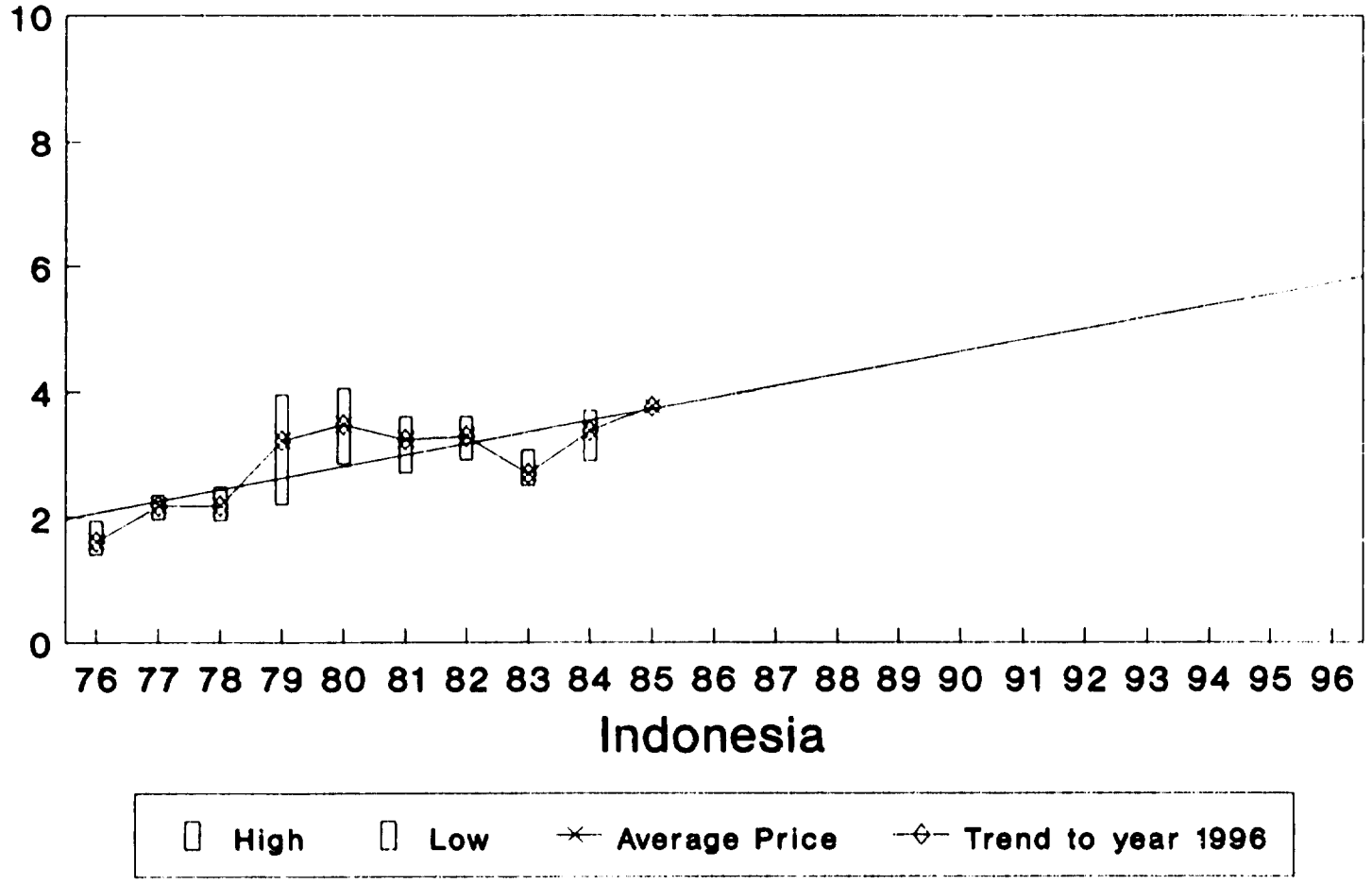
Citronella Oil - Annual Average Price
In Pounds sterling per Kg.



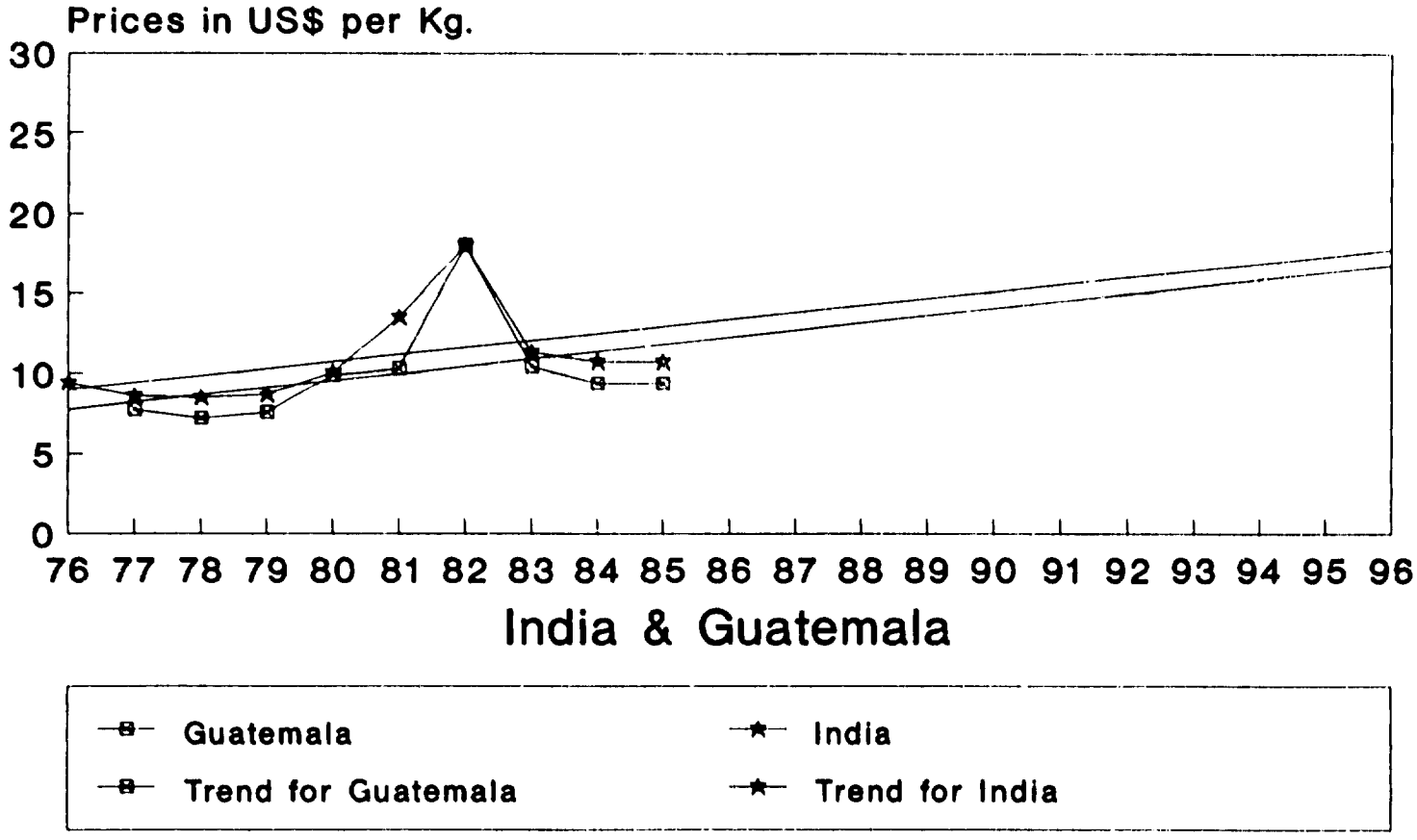
Citronella Oil - Annual Average Price
In Pounds sterling per Kg.



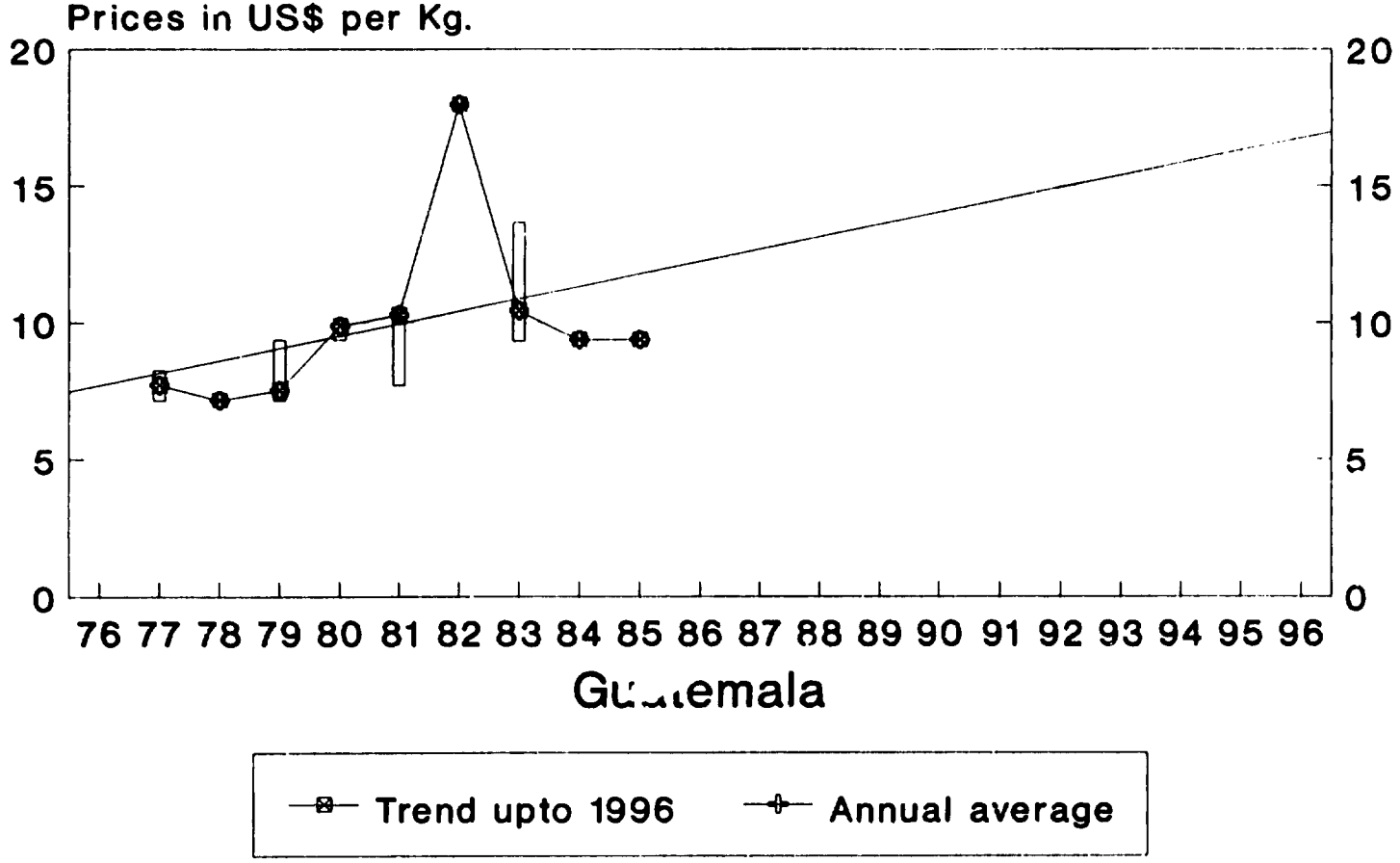
Citronella Oil - Annual Average Price
In Pounds sterling per Kg.



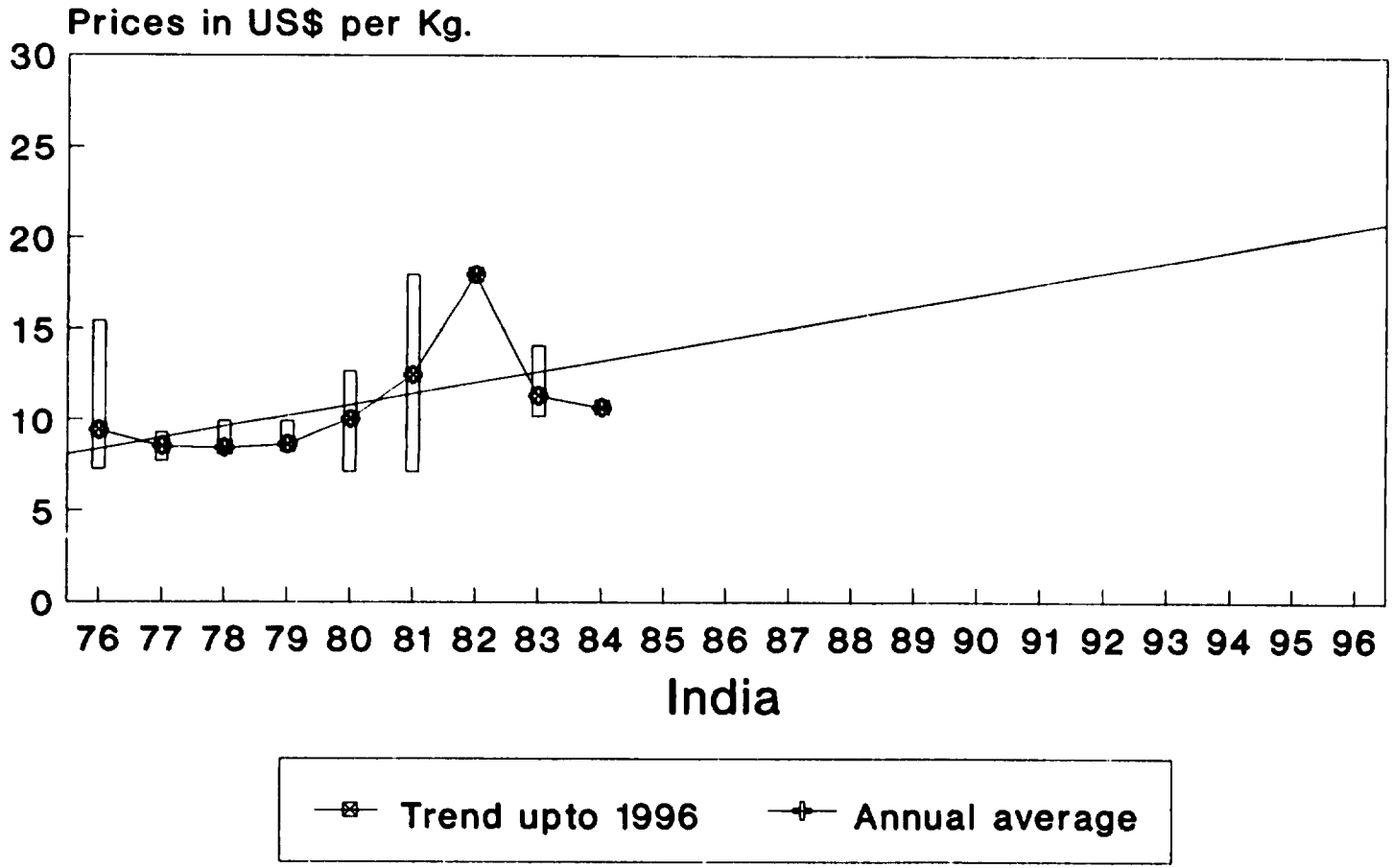
Lemon Grass Oil
Annual average prices
(US Dollars per Kg.)



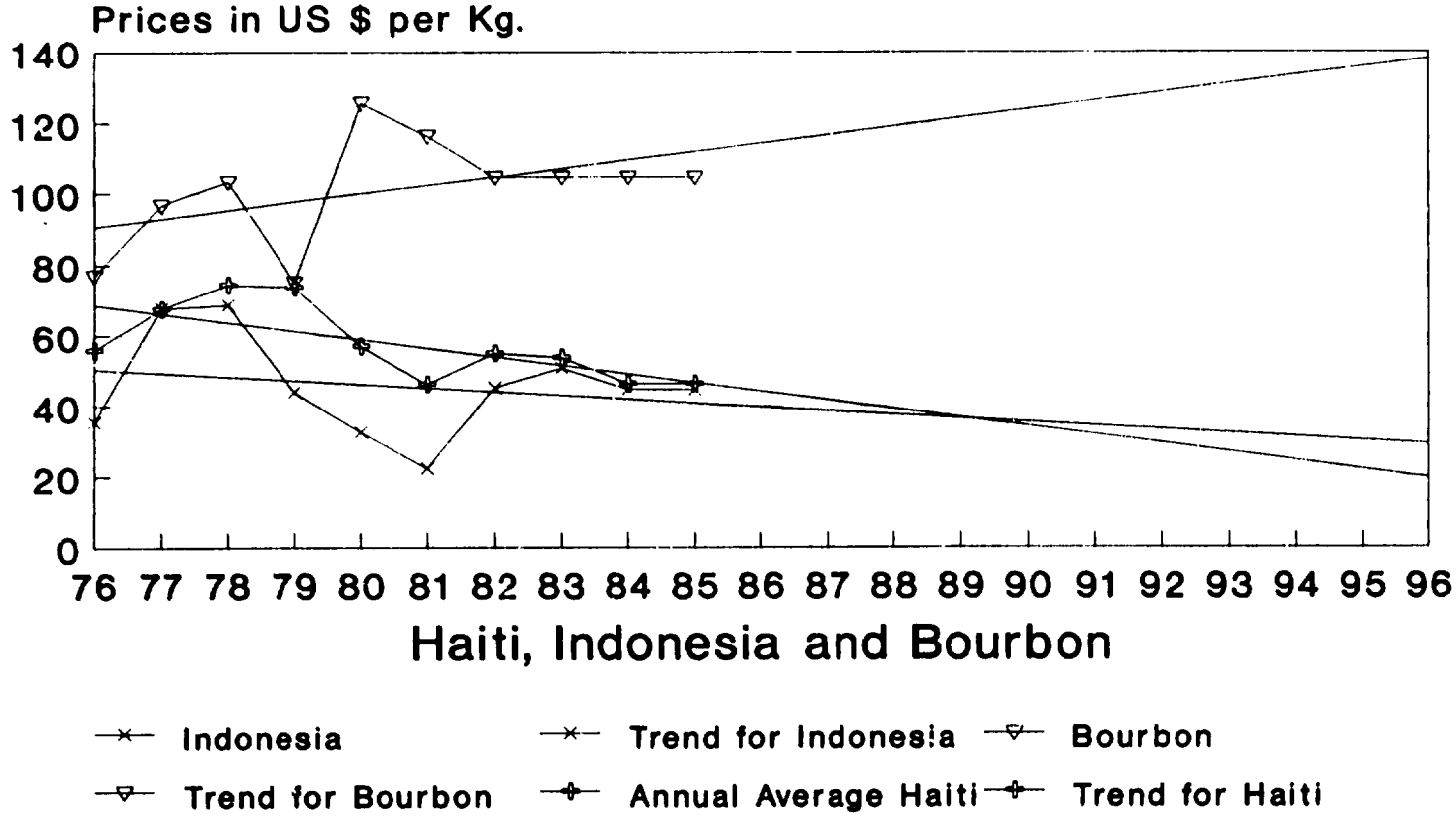
Lemon Grass Oil
Annual average prices & Price ranges
(US Dollarsg per Kg.)



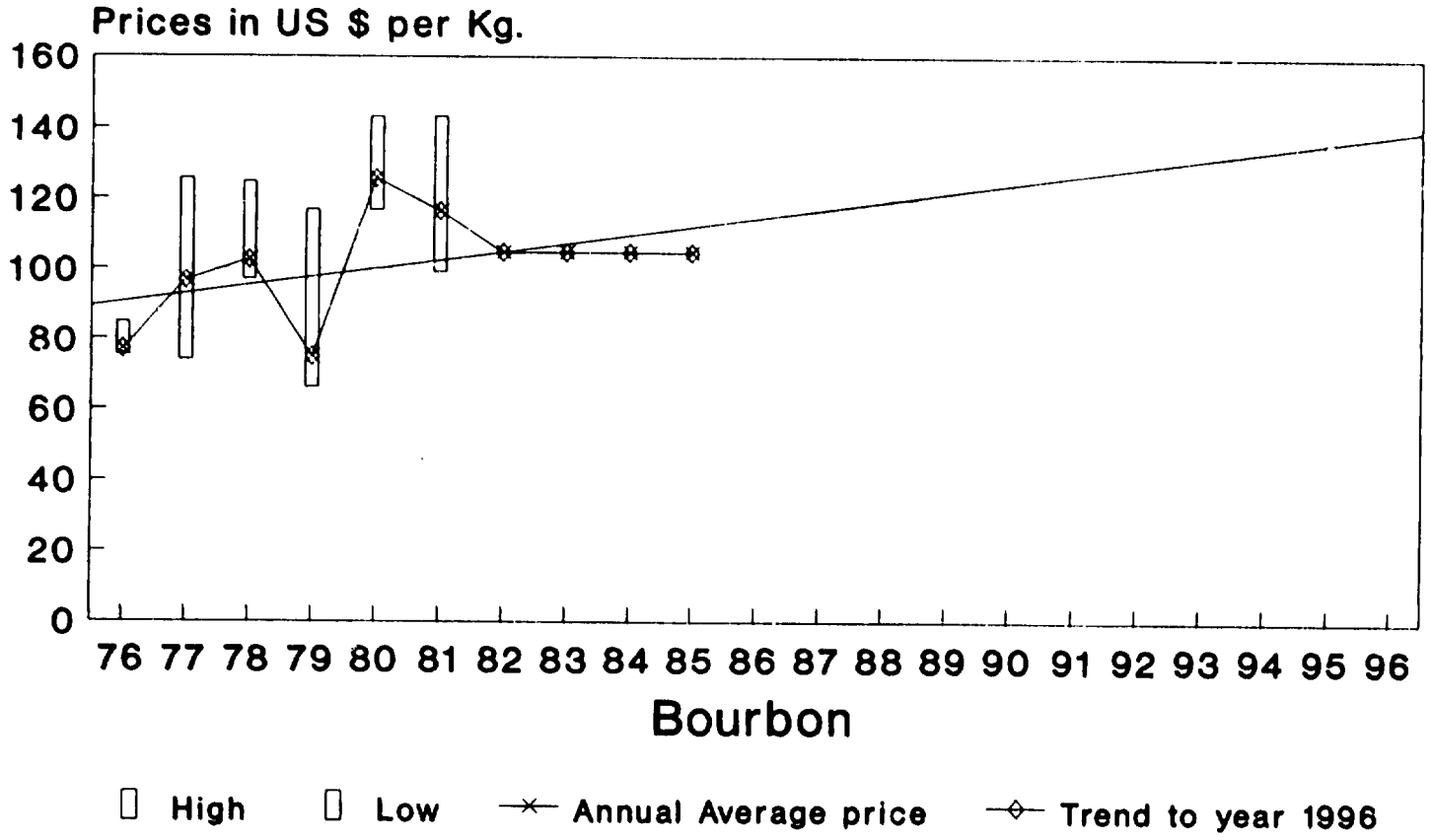
Lemon Grass Oil
Annual average prices & Price ranges
(US Dollarsg per Kg.)



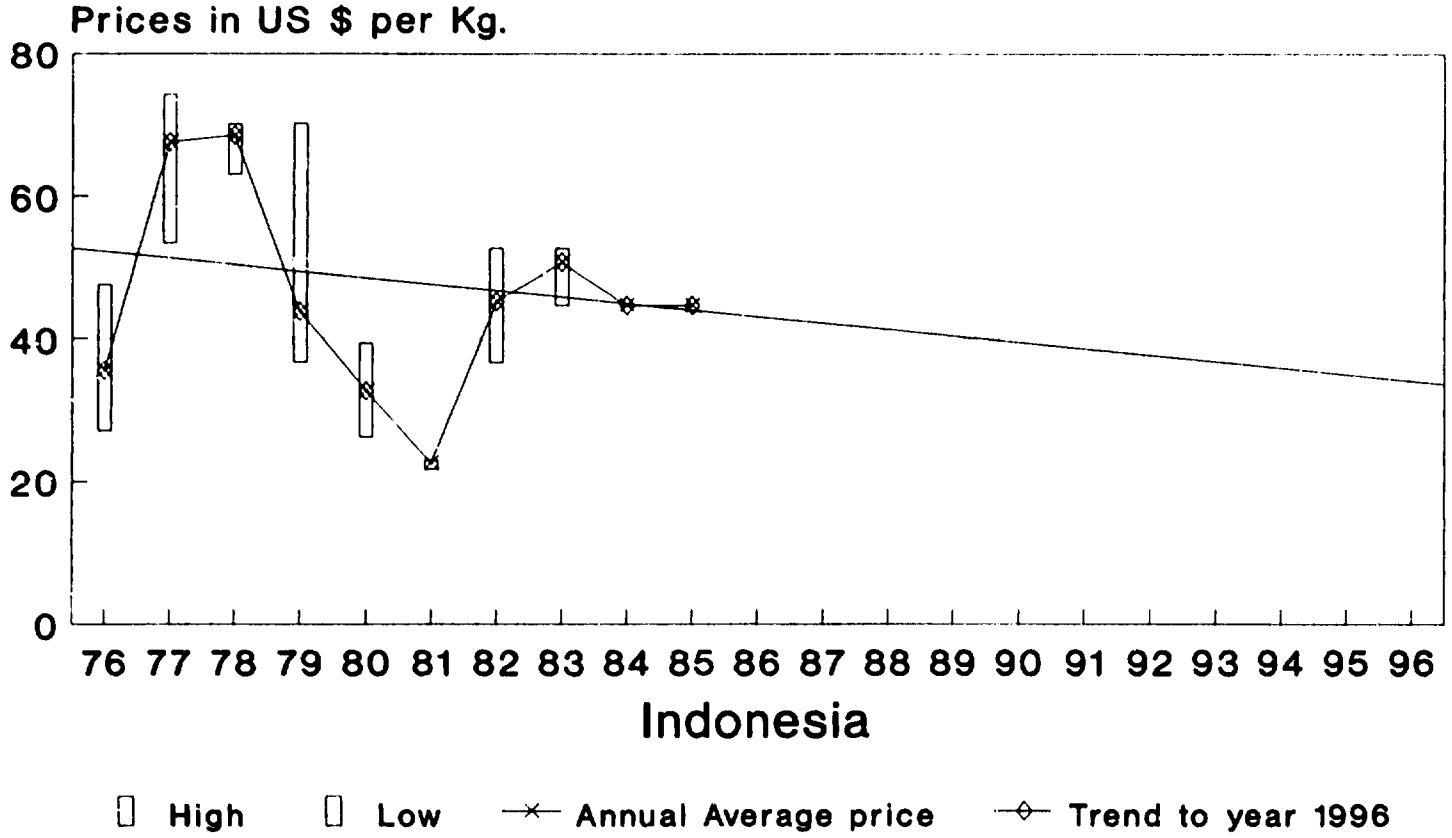
Vetiver Oil
Annual average price & Price ranges
(US Dollars per Kg.)



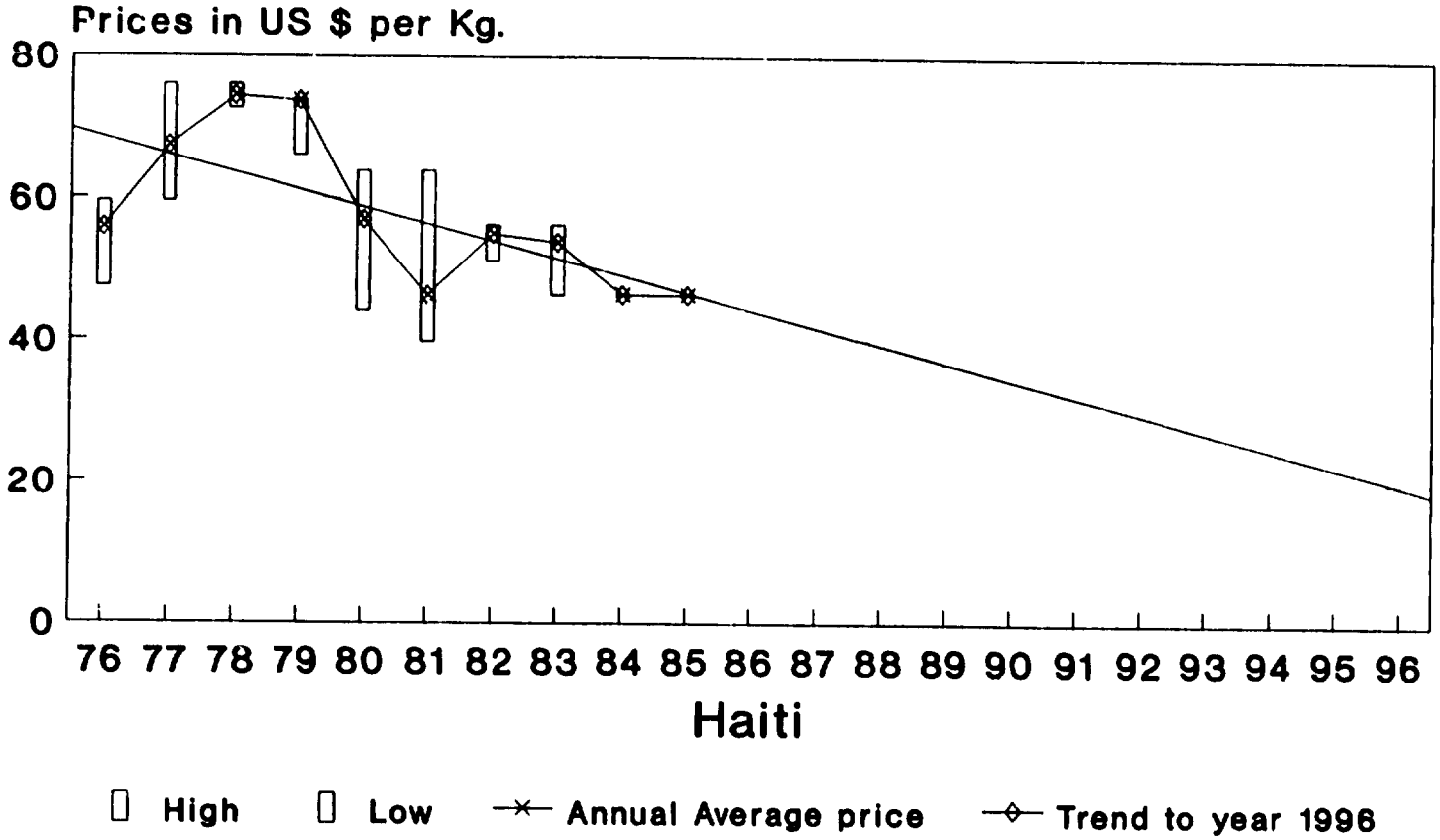
Vetiver Oil
Annual average price & Price ranges
(US Dollars per Kg.)



Vetiver Oil
Annual average price & Price ranges
(US Dollars per Kg.)



Vetiver Oil
Annual average price & Price ranges
(US Dollars per Kg.)



Selected List of Firms in the Essential Oils Trade

EEC

1. British Pepper and Spice Co.Ltd.,
Rhosily Road,
brackmills
north Ampton NN4 OLD
U.K.

2. Bush Boake Allen Ltd.,
Blackhorse Lane
London E 17 S.G.P.
U.K.

3. C.C. Spice U.K. Ltd..
Astmoor
Runcorn
Cheshire W A T IPE
U.K.

4. H.L. Daniels Ltd.,
Longfield Road,
Tunbridge Wells
Kent,
U.K.

5. Lionel Hitchen (Essential Oils) Ltd.,
50, Albert Road North,
Reigate,
Survey,
U.K.

6. International Flavours and Fragrances (U.K.) Ltd.,
Crown Road,
Southbury Road,
Enfield, Middlesex EN1 ITX
U.K.

7. Ungerer & Co.Ltd.,
Flint Road,
Herts SG 6 1 JA
U.K.

8. Zimmermann Hobbs Ltd.,
Dawson Road,
Bletchley
Milton Keynes, Bucks MK1 IJE
U.K.

9. Adrian SA
15, rue de Cassie
13008 Marseille
France

10. Bernard et Honnorat Sa
BP 67
06332 Grasse,
France

11. Pierre Chaurt SA
83770, Seillans,
France

12. Lautier Fils
06, Grasse
France

13. V. Mane Fils
06620 Bar-sur-Loup
France

14. Naarden International (France) SA
06, Grasse
France

15. P.Robertet et Co.
Avenue Sidi-Brahim
06333, Grasse
France

16. Roure Bertrand Dupont SA
27, Avenue Pierre-Senard
06130 Grasse,
France

17. Schmoller et Bompard
Chemin de la Madeleine
06331, Grasse
France

18. Dragaco Gmbh
D-3450 Holzminder
Germany

19. Hermann Dcillberg
Alsterdorferstrasse 19,
D-2000 Hamburg
Germany

20. Frey and Lau
Behringstrasse 116
D-2000 Hamburg 50
Germany

21. Haarmann and Reimer GmbH
D-3450 Holzminden
Germany.

22. International Flavours and Fragrances (Netherland) BV
Zevenheuvelenwig 60,
5048 AN Tilburg
Netherlands.

23. Maschemeijer Aromatics,
P.O.Box 4170,
Orival 81
1009 AD Amsterdam,
Netherlands

24. Mirandolle Voute and Co. BV
Maasstraat 12 a - 14 a
3016 DC Rotterdam
Netherlands.

25. Naarden International
P.O.Box 2,
1400 CA Naarden Bussum
Netherlands

26. Polak's Frutal Works
Nijverheidsweg rid 7
Amersfoort
Netherlands

27. Jules Chiquest SA
Deispitzstrasse 11
Bau 181
4142 Bosle
Switzerland

28. Giraudan SA
CJ-1214 Verrier Genera
Switzerland

29. Firmenich SA
CH 1211 Genera 8
Switzerland

30. Sterling Sniff Italia SPA
Str 1 Prov. 3.7, di Agella
06073 Solomeo Corciano
(Perugia),
Italy.

31. S.I.L.E.A. SRL
Largo Bardonecchia 175
1041 Torino
France

32. Sacmar SRL
Via Lanino S
20144 Milano
Italy

33. Quest International Italia SA
Via. A Costa 112
40067 Rastignano
Bologne
Italy.

34. Original Oils SPL
Zona, Industriale
89052, Campo Calabro
Italy

JAPAN

1. Fitzoche Dodge and Olcott (Japan) Ltd.,
No. 1224, Ogura
Suiwai-ku
Kawasaki,
Japan.

2. T. Hasegawa & Co. Ltd.,
No. 9, 4 -Chome
Honcho,
Nihonbashi
Chuo-ku
Tokyo 103,
Japan

3. I.F.F. (Japan) Ltd.,
Green Fantasia Building
11-11 Jingumae
1-Chome Shibuya-Ku
Tokyo 150
Japan.

4. Naarden International Japan Ltd.,
Central Building
2-5-14 Choja-machi,
Naka-ku
Yokohama 231
Japan

5. Ogawa and Co.Ltd.
4-15 Nihonbashi Honcho
Chuo-ku
Tokyo 103
Japan

6. Sakae Aromatic Co. Ltd.,
11 4 - Chome
Nichonbashi Honcho
Chuo-ku
Tokyo 103
Japan

7. Soda Aromatic Co. Ltd
Soda Building
No. 14, Nihonbashi-Honcho
4-Chome, Chou-ku
Tokyo 103,
U.S.A.

8. Takasago Corporation
3-19-22 Takanawa,
Minato-ku
Tokyo 108

9. World Fragrances Co.Ltd.,
Ishikura Building
2-5 Nihonbashi - odenmacho
Chuo-ku
Tokyo 103,
Japan

UNITED STATES AND CANADA

1. Givaudan Ltd.,
   3470 St. Antoine Street West,
   Montreal H4C 1B1
   Canada

2. The John D. Walsh Co.
   65, Glan Avenue
   Glen Rock, New Jersey 07452,
   U.S.A.

3. Norda Inc.
   140 Route 10,
   East Hanover
   New Jersey 07936
   U.S.A.

4. George Uhe Co. Inc.
   76, Ninth Avenue
   New York, N.Y. 10011
   U.S.A.

5. Naarden International USA Inc.
   43-23 37th Avenue
   Long Island City
   N.Y. 11101
   U.S.A.

6. Ungerer & Co.,
   4, Bridgewater Lane
   P.O.Box 11, Lincoln Park
   New Jersy 07035,
   .U.S.A.

7. Polak's Frutal Works Inc.,
   Middle Town, N.Y. 10940,
   U.S.A.

8. Lever Brothers Co.,
   390 Park Avenue
   New York,
   N.Y. 10022
   U.S.A.

9. Polarome International Inc.
   22, Ericson Place
   New York,
   N.Y.
   U.S.A.

10. Ludwig Mueller Co.Inc.
    2, Park Avenue,
    New York, N.Y. 10016,
    U.S.A.

11. Mc Cormick Co.Inc.
11350 McCormick Road,
Hunt Valley
Maryland 21031,
U.S.A.

12. Lautier Aromatiques
5, Pearl Court
Allendale
New Jersy 07401,
U.S.A.

13. E.L. Scott & Co. Inc.
1, World Trade Centre, Suite 2347
New York, N.Y. 10048
U.S.A.

14. Biddle Sawyer Corporation
2, Penn Plaza
New York, N.Y. 10001
U.S.A.

15. Colgate - Palmolive Co.,
300 Park Avenue
New York, N.Y. 10022
U.S.A.

16. L.A. Champon & Co. Inc.,
70, Hudson Street
Hoboken
New Jersy 07030,
U.S.A.

17. Crompton and Knowles Corporation
17-01 Nerine Road,
Fair Lawn
New Jersey 07410
U.S.A.

18. Firmenich Inc.
P.O.Box 5880
Princeton
New Jersey 08540
U.S.A.

19. Felton International Inc.
599, Johnson Avenue
Brooklyn N.Y. 11237
U.S.A.

20. Fritzsche Dodge and Olcott Inc.
76, Ninth Avenue,
New York, N. Y. 10011
U.S.A.

21. Givandan Corporation
100, Delawanna Avenue
Clifton
New Jersey 07014
U.S.A.

22. Haarmann and Perimer Corporation
P.O.Box 175
Springfield
New Jersey 07081
U.S.A.

23. D.W. Hutchinson & Co.
700, South Columbus Avenue
Mount Vernon,
N.Y. 10550
U.S.A.

24. International Flavours and Fragrances (US)
600, State Highway 36,
Hazlet, New Jersey 07730,
U.S.A.

25. Ivolin Enterprises
500, Fifth Avenue, Suite 4330,
New York,
N.Y. 10036,
U.S.A.

CHINA

Guangdong Native Produce Import and Export Corp (Group)
Essential Oil and Spice Co.,
108, Jiang Nan Road,
Central
Guangzhou
China

USSR

V/O Soyuzaagrochemieexports
UL, Gritzevetskaya 2, 119900
Moscow,
USSR

THE SOURCES AND USES OF MARKETING INFORMATION ON ESSENTIAL OIL FOR ZSTC MARKETING AND DISTRIBUTARY DIVISION

MARKETING INFORMATION

The scale and nature of natural essential oil production and trade make the collection of marketing information difficult.

SUPPLY - DATA

Natural essential oils are produced from a large range of crops in a large number of countries, often on a small scale by a large number of small holder farmers. Some are tropical countries like Zanzibar, some are temperate, some are annuals, some are tree crops with medium to long gestation periods, some derive only a small part of their value from their oils content, others like Zenzibar depends entirely one crop and its oil earnings for their economic survival. There are many difficulties and risk of uncertainties in obtaining and forecasting accurate supply date: climate changes, soil, diseases, variable yields, poor organization, distance and language problems all contribute to the problem.

World trade in natural essential oils is valued at less than US$ 500 million and volume is less than 40,000 tones. Citrus oils (orange, lemon, lime) account for almost 50% of international trade volume but less than 15% by value, a further

10 - 15 important natural essential oils must be analysed to bring volume to 75 - 80% and bring value up to 70%. A further 150 - 200 'minor' essential oils account for the residual 30% of the trade by value. Occasional production data on some of the major oils are available but very often they are only fragmentary production and trade statistics on many of these essential oil. In some countries trade statistics do publish separate data on a number of the major essential oils that they either import or export. Very often essential oils are in "Other all essential oils n.e.s" category.

DEMAND - DATA

Consumption and demand for natural essential oils also present certain difficulties. The large number of oils traded and their large range of end users in both the flavor and fragrance sector, the reluctance of both buyers and sellers to several certain types of information, the inability to obtain data on stock levels all contribute to the problem.

The process of gathering, analysing and publishing the supply and the demand data, is costly and most published data are incomplete or inaccurate or both. Some organization based on these data have given a pessimistic picture to most oils when is actual fact, it is contrary to what such organization reveals.

DATA NEEDS

(A) STATUS - namely the quality, availability and regularity of supply of each oil from the various origins. Traders are interested on the present and future product volumes than historical statistics. Traders in essential oils are interested in the growing consumer markets in new markets like the unified Germany, the liberated East Europe and glasnot USSR together with the developments in China and India. In the short term this could well lead to a reduction of supply of certain naturals to the market and the need for new supply sources. This in turn could lead to a very different and more turbulent pattern of world trade as well as a change in the competitive position of some of the natural vs synthetic essential oils and derivatives.

(B) QUALITY - this implies the composition, flavor and aroma characteristics of each oils from the various origins.

(C) PRICE - namely the prevailing CIF or FOB prices on supply, quality and purchase volumes.

Suppliers of essential oils like Zenzibar need data on price and consumption trends plus quality requirements in importing countries, and equally important, production and export costs and trends in other supply countries, of synthetics, in addition to theirs. On the demand side the potential future use and competition from synthetics needs to be monitored in a wide range of industries and end-uses facing widely differing demand and growth conditions. These data are of critical importance in making both short and long term policy decisions.

AVAILABLE INFORMATION SOURCES

The currently available data consists of:

(A) Published information, including trade statistics and trade press;

(B) Formal and informal trade information networks.

PUBLISHED SOURCES

There are three types of published market information sources:

(A) Market exports;

(B) Trade statistics;

(C) Current market reports.

Market Reports - A brief review of the supply position of selected major producers and trends in the major markets for 50 essential oils can be found in the International Trade Centres (ITC) 1986 publication and 1982 (ITC) publications.

Spices : A Survey of the World Market (1982).

Essential Oils and Oleoresins (1986)

The Overseas Development Natural Resource Institute (ODNRI) has published a series of studies on the world markets for various spices and essential oils.

G 167 - Selected Market for the Essential oils of Patchouli and Vetivar.

G 171 - Selected Market for the Essential oils of Lemongrass, citronella and Euclayptus (1983)

G 172 - Selected Markets for the Essential oils of Lime, Lemon and Orange (1983).

G 155 - The Market for Chillies and Parika (1982)

G 161 - Selected markets for Ginger and its derivatives with special reference to dried ginger (1982).

G 184 - The United Kingdom Markets for Cloves, Nutmeg, Mace, Cinnamon and Cassia (1984)

G 193 - International trade in Cloves, Nutmeg, Mace, Cinnamon, Cassia and their derivatives (1986)

G 198 - The market for vanilla (1986).

These ITC publications can be obtained Free from:

The International Trade Centre (UNCTAD/GATT)
Palais Des Nations
CH - 1211, Geneva - 10
Switzerland

The ODNRI publications can be obtained free from:

The Publications Section
ODNRI,
Central Avenue,
Chatham Maritime,
Chatham, Kent ME 4 4TB
U.K.

The Plant Commodities Economics Section of the ODNRI could also supply free brief market notes and data sheets on various essential oils.

TRADE STATISTICS

This is an important source of marketing data that can be supplemented by other published material.

The main sources are:

- US Essential Oil Trade (ETEA - 2) (Annual) published by-

  Foreign Agriculture Service,
  Information Division
  Room 4644 - 5
  US Department of Agriculture
  Washington DC 20500 USA.

- NIMEXE (Analytical Tables of Yearly Trade) (Annual)
  Eurostat (Bureau de Liaison)
  Batiment Berlayment,
  Rue de la loi, 200,
  B - 1949 Bruzelles
  Belgium.

- Japanese Foreign Trade Statistics including JETRO publications.

- Market Opportunities Offices in Sweden, Denmark, Finland, Norway, Germany, Netherlands. Annual Report of Warren Verein de Hamburger Borse, Germany is a vital report.

- Trade Statistics of Switzerland, Austria, Canada, Latin America, Key S.E. Asian markets, Australia and New Zealand.

FAO Trade Year Book published annually by FAO Rome is very useful.

The Fruit and Tropical Products published by the Commonwealth Secretariat is very useful.

Current Market Reports

Two key trade journals provide regular but not always accurate price information and occasional articles on particular developments in essential oils and synthetic competitive products.

Chemical Marketing Reporter (weekly)
Published by Schell,
100 Church Street,
New York, N.Y. 10007, USA

This journal covers mainly the US market but occasional articles on production and trade statistics/development elsewhere are published. Regular monthly summaries of the US imports of natural essential oils are also published.

Commodity Week (Weekly)
Published by
Public Ledger
Turrent Group PLC,
P.O.Box 54,
Rickmansworth,
Herts WD 3 ISN, U.K.

This along with the Public Ledger would provide insight into price trends.

A variety of journals and commodity papers provide up to date information on market trends and prices. They include apart from above.

- Cosmetic World News
- Parfumerie and Kosmetik (monthly) Postbachjo 2869, 6900 Heidelberg, W. Germany.
- Parfums Cosmetiques et Arimas (6 time a year) 5, Rue Jules - Lefbure, 75009, Paris, France.
- Perfumer 2nd
- Flavorist International - (every two months) P.O.Box 318, Wheaton, Illinais, 60189, USA.
- Indian Perfumer, HBTI Campus, Nawabganj, Kapur, New Delhi 110 030 India
- Indian Spice Newsletter - The Spice Board, World Trade Cent. e, MC Road, Ernakulam, Cochin, Kerala, India.

- Indian Cocoa, Arecanut and Spice Journal - (by monthly 1/1143 Cannanore Rd, Kerala, India.

- Pepper Marketing Bulletin - The Pepper Marketing Board, I.M. Swan Bldg. Jalan Abell, Kuching, Sarawak, Malaysia.

- Pepper News - The International Pepper Community, 3rd Floor, Wisma Batri, JL. H.R.Rasuna air, Kar, 81, Kuningan, Jakarta, Selatan, Indonesia.

- ITC Market News Service (MNS)
  Provided by telex or letter weekly.

A more reliable source of price information can be found from selected merchants price lists and market reports which could be obtained by requesting them. They are:

- FUGRST DAY LAWSON, St. Clare House, 30-33 Monories, London ECON, ILN U.K.

- PINES AND REID LTD 19, Earl St. London EC 2 A & AL.

- AMC CHEMICAL - Essential Oils Department, Adelaide House, London Bridge, London EC4R 9 DT. U.K.

- BUSH BOAKS AUEN - Natural Products Division, Essential Oils Price List, Blockhorse Lane, London E17 SQP.

- JOHN KELLY'S (LONDON) LTD, 31-32 Prescot St. London E1888.

- L.A. CHAMPON, POB 950, Jselin, N.J. 08830, USA.

- GEMGE UHE CO. INC. 76, Ninth Avenue, Mew York, NY 10011, USA.

- FRBY & IAU GMBB, Norderstedt, Hamburg, Germany.

- PAUL KARDERS GMBB, 2000 Hamburg 11, Zippelhaus 5, Postfach 11 12 73 Germany.

- C. MELCHERS 7 CO. 2820 Bremen 77, Postfach 770340, Germany.

- ADRIAN, France.

- DAARNBOUWER & CO GMBB Germany.

- OST-WEST STRASSE 49 Germany.

- ASIA HOUSE-D 2000 Hamburg, Germany.

- DAARNHOUWER & CO FAR EAST (PVT) LTD- P.O.Box 1565 Singapore 9031.

- MAN PRODUCTION P.O. Box 253, 3000 AG Rotterdam, Netherlands.

A wide variety of marketing and price data are contained in the following trade journals:-

- Cosmetic World News (monthly)
  130, Wigmore Street
  London W1 U.K.

- Soft Drinks Management International(monthly)
  National Association of Soft Drink Manufacturers
  The Gate House
  2, Holly Road
  Twickenhams
  Middlesex U.K.

- Drug and Cosmetics (monthly)
  7500, Old Oak Boulevard
  Clereland, Chio 44130
  USA.

- Food Flavouring, Ingredient and Packaging (monthly)
  U.T P. House
  33/35 Bowling Green Lane,
  London EC 1 ODA
  U.K.

- Naval Stores Review (bi monthly)
  4640 S. Carrollton Avenue,
  New Orleans,
  LA 70119
  USA

- Japanese Cosmetic Science Society Journal (monthly)
  6-2-10 Hongo,
  Bunkyo-ku
  Tokyo - 113, Japan.

- JETRO - Access to Japan's Import Market
  2 - 5 Toranamon,
  Minate-ku
  Tokyo, Japan.

There are formal and informal information sources

- International Congress of Essential Oils, Frangrances and Flavour.

- Malaysian Essential Oil Association Conference (Dec.5, 1990).

Ultimately in terms of marketing there can be no substitute for regular telex, fax correspondance and telephone contacts between buyers, delers, brokers and end-wers, importers, compounders and by the ZSTC. This can only be achieved through proper coordinated efforts between the Marketing and the Distillery Management of the ZSTC.

Annex X

LIST OF PERSONS MET DURING THE MISSION

ZSTC

Mr. Abdul Rahman Rashid	-	General Manager
Mr. Hamad Khamis Hamand	-	Deputy General Manager
Mr. Shaib Ali Mossi	-	Economist
Mr. Nasib S. Omar	-	Distillery Manager, Chake Chake
Mr. Ramadhan K. Eeruz	-	Production Manager/ Engineer, Distillery Chake Chake.
Mr. Ahaneda B. Kombo	-	Administrative Officer, Distillery Chake Chake.
Mr. Sulaiman Shukuru	-	Accountant, Distillery, Chake Chake.
Mr. ..... Ali Shaak	-	Foremen, Distillation Distullery, Chake Chake.
Mr. S.M. Mdema	-	OIC, Chake Chake ZSTC Godown
Mr. A.K. Sulaiman	-	Officer - Supervision ZSTC, Godown, Chake Chake.
Mr. M.A. Salim	-	Bodownkeeper, Chake Chake.
Mr. M.K.M. Barut	-	Purchasing Officer, ZSTC Chake Chake.
Mr. S.H. Jumah	-	Manpower Management Officer, ZSTC, Chake Chake.
Mr. M.A. Naza	-	OIC Mkoani Centre, Pemba.
Mr. M.H. Omar	-	ZSTC Officers Mkoani, Pemba
Mr. A.H. Mohammed	-	ZSTC Officer, Mkoani, Pemba.

Mr. Rashid	-	ZSTC Deputy Manager Wete Officer ZSTC.
Mr. Badru Ali Zuber	-	Maintenance Forman Chake Chake Distillery, Pemba.
Mr. Henry A. Kalaisa	-	Marketing Manager, ZSTC, Zanzibar.
Mr. M.K. Mohideen	-	Asst. Marketing Officer, ZSTC, Zanibar.
Mr. Musa Said Ahamed	-	Crop Surveyor, Cloves ZSTC.

ZANZIBAR SHIPPING AND WHARFAGE

Mr. Ahamed S. Abdul Rahman	-	General Manager, Zanzibar Wharfage Corporation

ZANZIBAR OFFICE DAR ES SALAAM

Mr. Fatawi	-	Acting Director Coordination Office Zanzibar, Dar Es Salaam

Ministry of Agriculture

Mr. Massoud M. Hemed	-	Director, Dept. of Agriculture, Research and Extension, Zanzibar.
Mr. M.A. Ghassany	-	Special Advisor (Spices) Dept. of Agriculture Unguja, Zanzibar.
Mr. Hamed Talib	-	Kilimo Clove Research Project, Pemba.
Mr. Ali Abdalla	-	Kilimo - Pemba.
Mr. Jecha Ramadan Ajuli	-	Chief Produce Inspector.
Mr. Robert Woods	-	Clove Research Project Wete, Pemba.

Mr. S.M. Salaiman	-	Examiners of Produce Chake Chake Distillery
Mr. J.K. Ali	-	Examiners of Produce Chake Chake Distillery
Mr. Omai Issa	-	OIC Ministry of Agriculture Wete, Pemba.
Mr. Jumma Fadhial	-	Chief Chemist
Mr. John Steven Sulaiman	-	Asst. Chemist

Ministry of Finance and Planning

Mr. Abdulla Jume Khatib	-	Commission for Investment
Mr. Abdulla M. Bavana	-	OIC MOF Pemba.

Ministry of Trade and Industry

Mr. Hakeem S. Sanani	-	Trade Office, Pemba ZSTC.

Private individuals

Mr. Yoosoof Hassania	-	Retired Agricultural Officer

UNIDO Office, Dar Es Salaam

Mr. Akim	-	Asst. to UNIDO

List of Publications Recommended to the ZSTC Marketing Division, Zanzibar

International Trade Centre (1986) - Essential Oils and Okaresoinc (free on request)

International Trade Centre (1982) - Spices Vol. I and II (free on request)

F. Rasengarten Jnr (1973) - The Book of Spices, Pyramid Book N.Y. USA.

Purseglare - (1981) Spices - Brown, Green and Robbins 2 Volumes

N. Sahaderan (1989) - Green Fingers, Malasia.

USDA Annual - US Essential Oil Trade

Chemical Marketing Reporter - Schnell Publishing Co. New York, USA.

The Public Ledger London USA (weekly)

Cosmetics World News London (Monthly)

Parfunetic and Kosmetik (monthly)

Parfums Cosmetiques et Aromas

Perfumer and Flavourist International (every two months)	
Fruits and Tropical Products	- Commonwealth Secretariat. U.K. (bi-annual)
US Spice Trade	- Foreign Agricultural Service, USDA, Washington, USA.
FAO Trade Year Book,	- FAO, Rome
NIXEX (Analytical Table for Foreign Trade - EEC)	- Eurostat, Belgium.
Annual Report	- Waren Verein de Hamburger Borse - Germany.
JeTRO Publications on the Japanese Market.	
Indian Spice News Letter	- The Spice Board - India.
Pepper Marketing Bulletine	- Malaysia.
Pepper News	- International Pepper Community, Indonesia.
Merchants Price List	- (Supplied free on request)
	- Daarnhouwer & Co GMBH
	- Ost - West Strasse 49
	- Asia Haus, Hamburg, Germany
	- Daarnhouwer & Co Far Est (Pvt) Ltd Singapore.
	- Man Productions, Netherlands

ODNRI Publications on Spices and Essential Oils

Market Reports and Price Lists.

- E.L. Scott & Co. Inc.
  N. York USA.
- Fuerst Day Lawsons
  London. U.K.
- Paines and Reid Ltd.,
  London, U.K.
- AMC Chemicls, London, U.K.
- Bush Boake Allen, London,
  U.K.
- John Kelley's (London) Ltd.
- L.A. Cherpon New York,USA.
- George Uhe Co.Inc.USA.
- Iroliss Enterprises N.Y.
  USA.
- Frey & Lau Gmbh, Hamburgh,
  Germany.
- Paul Karders Gmbh -
  Hamburg.
- Adrian France

Indian Perfumer (quarterly)

Japanese Cosmetic Science
Society Journal (monthly).

1.	BARGAINING FOR RESULTS	- J. WINKLER
2.	BEHAVIOURAL ASPECTS MARKETING	- K.C. WILLIAMS
3.	BUSINESS LAW	- A.A.PAINTER AND R. LAWSEN.
4.	BUSINESS ORGANIZATION	
5.	CASE STUDIES IN INTERNATIONAL MARKETING	
6.	ECONOMICS	- AN INTRODUCTION TO STUDENTS - FRANK LIVEREY
7.	EFFECTIVE SALES MANAGEMENT	- J.STRAFFORD AND COLIN GRANT.
8.	FINANCIAL ASPECTS OF MARKETING	- K. WARD.
9.	FUNDAMENTALS OF ADVERTISING	- J. WILMSHURST
10.	GLOSSARY OF MARKETING TERMS	- N.A. HART AND J. STAPLETON.
11.	HOW TO SELL A SERVICE	- M.H.B.Mc DONALD
12.	INTERNATIONAL MARKETING DIGEST	- M.H.B.Mc DONALD
13.	MARKETING BOOK	- PROF. M.J. BAKER
14.	FUNDAMENTALS AND PRACTICE OF MARKETING	- J. WILMSHURST
15.	MARKETING COMMUNICATION	- C.J. COULSON THOMAS
16.	MARKETING DIGEST	- M.J.THOMAS AND N.E. WAITE
17.	MARKETING PRIMER	- PROF. G.A. LANCASTER AND L.MASSINGHAM
18.	MARKETING PLANS	- M.H.B. Mc DONALD
19.	MARKETING MANAGEMENT	- R.M.S. WILSON
20.	MARKETING RESEARCH FOR MANAGERS	- S CROUCH
21.	MARKETING OF SERVICES	- D.W. COWELL
22.	THE PRACTICE OF PUBLIC RELATIONS	- W.HOWARD
23.	THE PRACTICE OF ADVERTISING	- N. HART

24.	PRICING FOR RESULTS	- J. WENKLER
25.	THE PRINCIPLES AND PRACTICE OF EXPORT MARKETING	- E.P. HIBBERT
26.	THE PRINCIPLES & PRACTICES OF SELLING	- A. GILLAM
27.	PROFITABLE PRODUCT MANAGEMENT	- J. WARD
28.	SALES FORCE INCENTIVES	- G.HOLMES AND N.I.SMITH
29.	THE STRATEGY OF DISTRIBUTION MANAGEMENT	- M. CHRISTOPHER
30.	THE MARKETING EDGE	
31.	HOW TO GET ON IN MARKETING	
32.	BODY LANGUAGE	
33.	MINI CASES IN MARKETING	- L. MASSINGHAM AND PROFESSOR G.A.LANCASTER
34.	ESSENTIALS OF STATISTICS IN MARKETING	- C.S.GREENSTEAD, A.K.S. JARDINE AND MACFARLANE
35.	PROFESSIONAL SELLING IN A MARKETING ENVIRONMENT	- K. STEWARD
36.	MARKETING INFORMATION SYSTEM	- T.WATKINS
37.	MARKETING FINANCIAL SERVICES	- T. WATKINS
38.	TRADE MARKETING	- G. RANDELL
39.	INTERNATIONAL MARKETING	- S.J. PAILWODA

AVAILABLE FROM

HEINEMAN PROFESSIONAL PUBLICATION
FREE PORT
P.O.BOX 380
HAUEY COURT
JORDAN HILL
OXFORD OX 2 8RS
U.K.

1)	National Bureau of Plant Genetics Resources Pusa Campus New Delhi 110012, India.	- Vetiver Hybrid 8 NC 66404 Palmarosa IC 31245 Peppermint
2)	Regional Research Laboratory Trivandram 695019 Kerala India.	- Pepper Cardamon Ginger Nutmeg
3)	National Research Centre for Spices Calicut.	- Pepper Cardamon Ginger Nutmeg Turmeric
4)	Aromatic & Medicinal Plants Research Station Kerala Agricultural University Odakkali Asamannur Post Ernakulam District Kerala 683549.	- Lemon Grass
5)	Export Crops Department Gatambe Peradeniya Road Peradeniya Sri Lanka.	- Cinnamon Citronella Pepper Cardamon Nutmeg.
6)	Central Institute of Medicinal and Aromatic Plants, P.O. Box No. 1 P.O. RSM Nagar Lucknow 226016 (UP) India.	- Essential Oil Lemon Grass -CIMAP/LS 48 Mentha Arvensis- CIMAP/Hybrid 77 CIMAP/MASI.
7)	Scientific Research Institute of Fragrance and Flavour Industry. Ministry of Light Industry PRC, 138, Fenyang Rd., Shanghai, China.	

Annex XIII

THE LIST OF PUBLICATIONS CONSULTED

Amina Salum Ali - The United Kingdom, Swiss and Dutch Markets for Zanzibar Clove Stem Oil PRODEC - Market Research Report No. 17/1983 The Helsinki School of Economics, Sept. 1981.

Tecotex - Clove Stems Distillery Pemba Zanzibar Technical Summary 1982, Paris.

Takrima & Grawitz - Report on Clove Oil Market in France (undated).

CF TC - Processing, Drying, Storing and Quality Control of Spice Using Low Cost Technology in Developing Commonwealth Countries, Singapore, March 1989.

Contract No. TT 8020 - Clove Stem Oil Distillery Pemba Between The Minister of Industry in Zanzibar and Societie Tecotex Paris France, August 1980.

ODNRI - Report on the Fourth visit to Zanzibar: Zsnzibar Clove Quality Improvement Study - A.E. Dann Project No. A 1554 Feb. 1989.

TDRI - R. 1330 (R) - Clove Pricing Policy D.L. Heydam, April/May 1986.

ISO - International Standards on Essential Oils.

Commonwealth Secretariat - Second Meeting on the International Spice Group, Singapore, March 1989 (Proceedings).

11th International Congress
of Essential Oils, Fragrances
and Flavours, New Delhi
Nov. 1989 Vol. 1 - 5.

UNIDO - Assistance to Essential Oils Industry - Maximising the Capacity of the Clove Distillery of Chake Chake DP/URT/86/026/A/01/37 Vienna August 1989.

S.S.Shukuru - Procurment of Clove from Franc before and after 1964 - An Analysis College of Business Education - Dar Es Salaam Research Paper 103 Oct. 1989.

GOZ - Investment Act 1986 Zanzibar 1989.

Borsa F. 1987 -

Coral Rag Agriculture : A Compilation of Secondary Data up to 1984, Mimeo.

Briant A.K. 1959 -

Report and Recommendations on the Present Position and Future Prospects of Agriculture in Zanzibar, Government Printers.

Clayton A. 1981 -

Zanzibar Revolution and Aftermath, London, C. Hurst

FAO Prawt W.L. 1989

"Strengthening Agriculture Research and Extension Service of the Ministry of Agriculture Livestock and NR of Zanzibar Rome, May 1989.

FAO/IFAD 1989

"Zanzibar SH Agriculture Development Project Prep. Mission 2 Vols. Feb. 1989.

FAO/UNDP 1976

"Appraisal of Food and Cash Crop Farming in Zanzibar and Pemba islands part of UNDP Project.

Hettige, Piyanie M.L. 1989

"Evaluation of Land Resources in Zanzibar Tanzania. Quantity Report FAO Zanzibar June 1989."

Land and Environmental Census for n.d.

Recommendation of the Structure of the commission for land and Environment Mimeo.

Middleton J. 1961

Land Tenn in Zanzibar HMSO Lands

National Coconut Development Project
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Annex IV

UNIDO

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

11 - 53

JOB DESCRIPTION

Marketing expert in essential oils

Post Title:	2 m/m
Duration:	
Date required:	1990
Duty Station:	Chake Chake, Pemba
Purpose of project:	Maximising the capacity of the Clove Distillery Chake Chake

Duties:

The expert will survey the present practices of trade in spices and essential oils in the light of the observations made in the previous UNIDO report, and in consideration of the aims of the present project.

The expert will make recommendations in regard to the following: -

a. Marketing and sales promotion of essential oils, with special reference to Clove Oils.

b. Prospective products other than those traditionally exported.

c. Methodologies for streamlining market practices.

Following his mission, the expert will be expected to furnish UNIDO a fully prepared report embodying his findings and recommendations.

Qualifications

A graduate in Economics, other science or Engineering with considerable experience (over 10 years) in marketing, sales cost-analysis pertaining to the Essential Oil Industry. Developing country experience an added qualification.

Language

English

Background information

Cloves (Eugenia caryophyllata) are the major crop in the Zanzibar Islands, which include Unguja and Pemba and are traditionally called the Clove Islands.

There are two major facilities for the distillation of clove buds and clove stem under the control of the Zanzibar State Trading Company (ZSTC). One is an almost obsolete plant, nevertheless with a considerable production capacity situated at Malindi in Unguja Island. The other is a modern plant at Chake Chake in Pemba Island.

In Pemba there is an established capacity but ensurement of maintenance is important.

A tuned to the distillation capacity of the plant, the ensurement of timely collection and organized drying of raw materials is crucial.

The Government expects UNIDO to provide support to enhance the economic, commercial and Technological structure to modernise the industry in Zanzibar.