



منظمة الأغذية
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COMMITTEE ON COMMODITY PROBLEMS

JOINT MEETING OF THE FOURTH SESSION OF THE SUB-GROUP ON BANANAS AND THE FIFTH SESSION OF THE SUB-GROUP ON TROPICAL FRUITS

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VALUE CHAIN ANALYSIS OF THE TROPICAL FRUIT SUB- SECTOR: THE CASE OF MANGO PRODUCTION, PROCESSING AND TRADE IN KENYA

I. INTRODUCTION

1. The Fourth Session of the Sub-Group on Tropical Fruits requested that the Secretariat undertake a market study of smallholders and traders along the mango value chain in Kenya. This document reviews fruit production and yield trends, mango production, marketing and processing, as well as future development prospects.

2. The horticultural sub-sector in Kenya comprises mainly fruits, vegetables and cut flowers. Vegetables dominate horticultural production, followed by fruits and cut flowers. In 2003, a total area of 373,000 hectares was dedicated to horticultural production, valued at US\$494.4 million.

Table 1: Percentage of cultivated area, volume of production and value of horticultural products (2003)

	% cultivated area	% Volume of production	% Value of Production
Vegetables	59	55	57
Fruits	40	44.8	32
Cut flowers	1	0.2	11

3. Mango has been the third most important fruit in terms of area and total production over the last ten years with bananas (including plantains) and pineapples as number one and number two respectively in terms of production. Production trends are presented in Figures 1 and 2. The output of mangoes has increased rapidly, along with those of avocados and passion fruits, while output shares of bananas and pineapples have declined.

Figure 1: Production of mangoes, avocado, passion fruit and papaya (1992-2007)

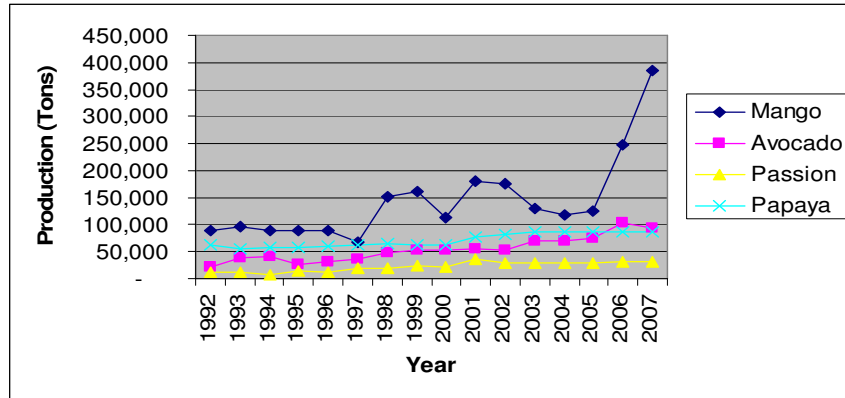
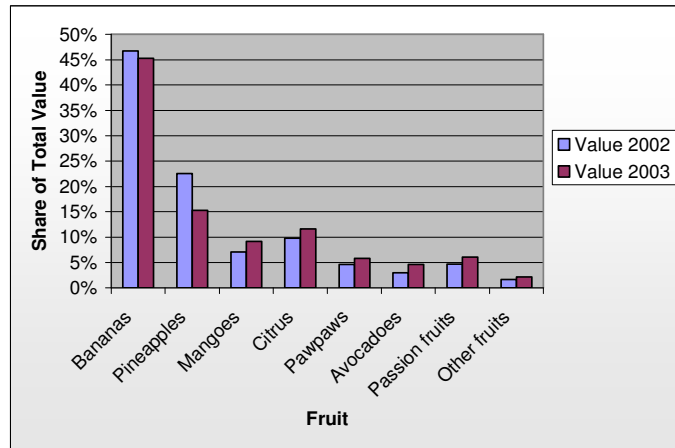


Figure 2: Value of major fruits grown in Kenya as a percent of total value, 2002 - 2003

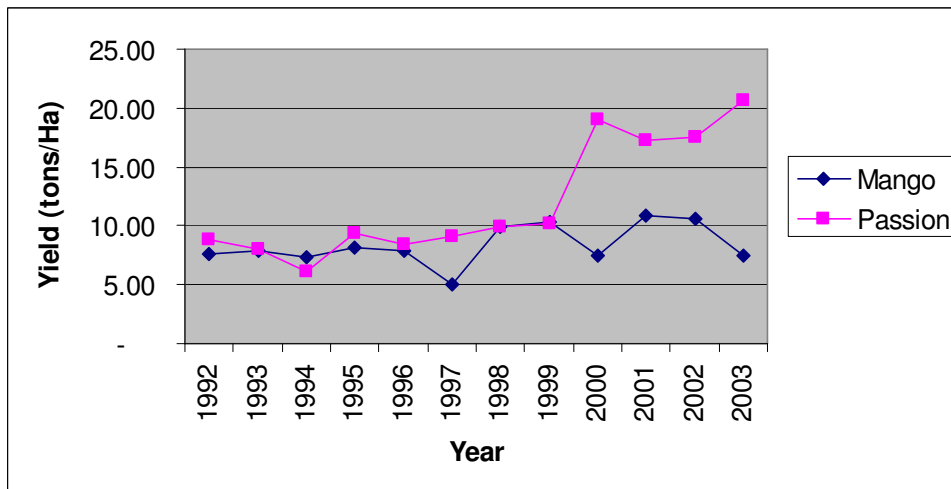


Source: Based on statistics from HCDA/MOA .

II. MANGO PRODUCTION, MARKETING AND PROCESSING

4. Mango output in Kenya has increased steadily, despite considerable variability in yields (Figure 3). In 2007, mango production was estimated at more than 384 000 tonnes.

Figure 3: Yields (tonnes/ha.) of mango and passion fruits (1992-2007)



5. Based on 2003 data, Eastern Province accounted for 54 percent, Coast Province for 22 percent and Nyanza Province for 8 percent (Table 2).

Table 2: Mango production 2002/2003 by province

PROVINCE	Hectares (Ha)		Production (MT)	
	2002	2003	2002	2003
Central	650	749	5,224	6,577
Coast	8,240	7,920	42,946	41,145
Eastern	4,668	4,750	91,521	99,730
Western	966	986	8,913	9,248
Nyanza	1,258	1,850	16,806	13,837
Rift Valley	566	683	6,579	8,337
N/Eastern	325	330	4,515	4,612
Total	16,673	17,268	176,504	183,486

Source: Ministry of Agriculture Annual Reports, 2002/2003

6. Two types of mango are grown in Kenya, the local and the exotic or improved varieties. The latter are usually grafted on local mangoes and are grown for the export market. Most local varieties have high fibre content which makes them unpopular for fresh consumption. Local varieties are usually left to grow naturally.

7. Both local and exotic varieties are grown in Eastern Province. The local varieties are Ngowe, Dodo, Boribo and Batawi. The exotic varieties include Apple, Kent, Keit, Tommy Atkins, Van Dyke, Haden, Sensation, Sabre, Sabine, Pafin, Maya, Kenston and Gesine. The districts with higher percentage of improved varieties are Thika, Embu, Mbeere, Meru Central, Makueni, Machakos and Meru South, while in Mwingi and Kitui have only small areas are cultivated with improved varieties.

8. Local varieties predominate in the production of Coast Province, namely, Ngowe, Boribo, Batawi and a few minor ones. The main exotic variety grown is Apple, which is mainly cultivated in Lamu, Malindi and Kilifi districts.

9. In Eastern and Coast Provinces, mango production is primarily rain fed. Where water is available, new orchards under irrigation have been established for export. The main difficulty for farmers engaged in exports is compliance with the EUREPGAP standards, which are required in the EC market.

10. Pests are the main factor affecting yields. The mango weevil is a major concern and farmers are making an effort to use recommended control measures.

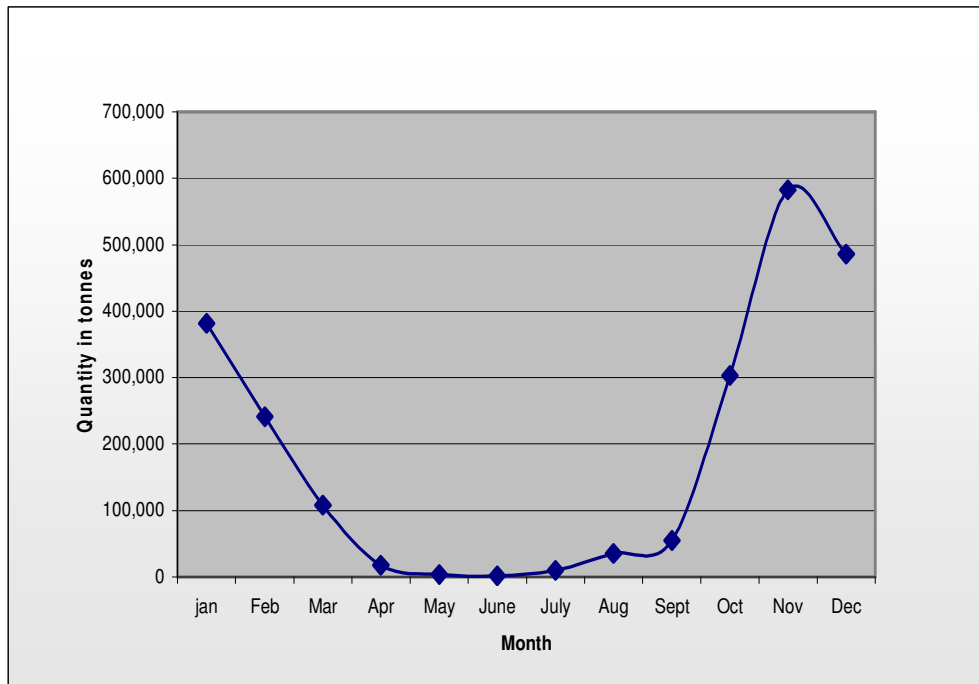
11. In Eastern Province, only one crop of mango is produced per year, while in Coast Province there are two harvesting seasons. In the Malindi and Kilifi districts, the two harvests yield an almost equal quantity. In Lamu 80 percent of the harvest is in April-July, while in the Tana River district, 70 percent of harvest is between October and February. The main exotic variety, Apple, is harvested in early September, slightly later than other varieties.

Table 3: Mango production in selected districts in Eastern and Coast Provinces of Kenya, 2003

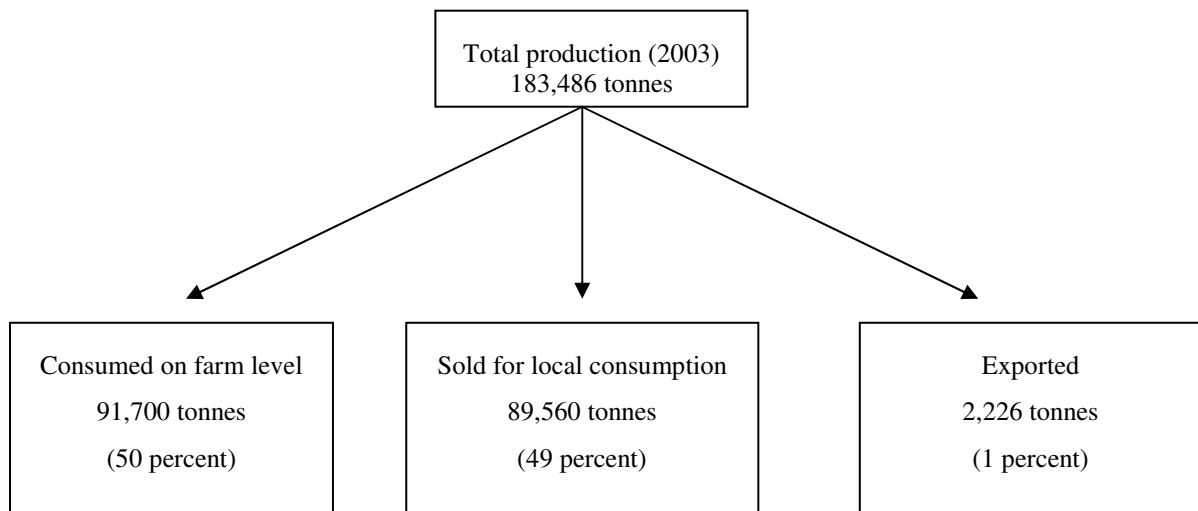
District	Hectares (Ha)	Production (tonnes)
Machakos	1 352	16 088
Makueni	490	4 900
Meru Central	600	5 400
Meru South	192	1 490
Embu	700	3 000
Mbeere	300	2 350
Mwingi	340	2 850
Kitui	1 287	12 870
Tana River	1 300	12 000
Malindi	1 253	8 806
Kilifi	1 295	9 667-
Lamu		7 000

12. In the lower parts of Tana River District, around Kipini, there is a distinct production seasonality due to floodwaters. Here mangoes are harvested slightly earlier compared to other locations. In Kenya, generally, mango supply peaks between October and February (Figure 4). Seasonality has serious implications for mango processing.

Figure 4: Mango supply seasonality in 2003



13. Most of the mangoes produced are consumed within the same production area, or sold in domestic urban markets. Fresh mangoes are either sold domestically or exported. Exports of fresh mangoes comprise a small proportion of national production.

Chart 1: Mango distribution channel in Kenya

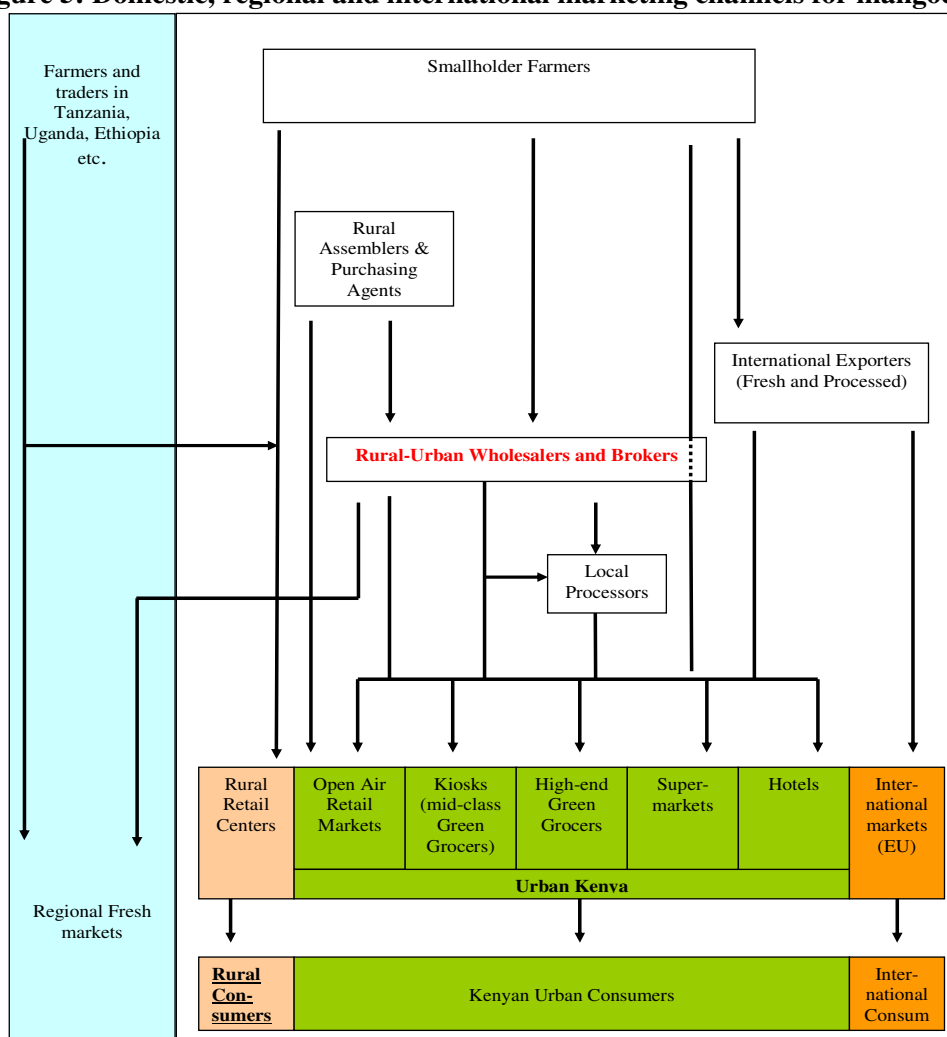
14. In 2003, for instance, export was slightly above 1 percent of production.

15. Only high quality fruits of exotic varieties are sold in the export markets. The districts that export substantial quantities of mangoes include Machakos, Meru Central, Meru South and Makueni. Some of the exporting companies buy mangoes directly from the farms and package them for export. The export market usually offers better prices than the domestic market. The prices offered also depend on the mango season.

16. Figure 5 shows the main marketing channels for mangoes in Kenya. The export market is served by few large private sector farms. There are about 22 mango exporters in Kenya. Independent smallholders produce the bulk of the mangoes for domestic markets. The brokers assemble the mangoes from producers and then supply the main open markets. Once consignments are delivered to the markets, wholesalers buy and sell to retailers who then sell to consumers in kiosks, other retail markets, green groceries and roadside markets. Processors often acquire the mangoes directly from the producers.

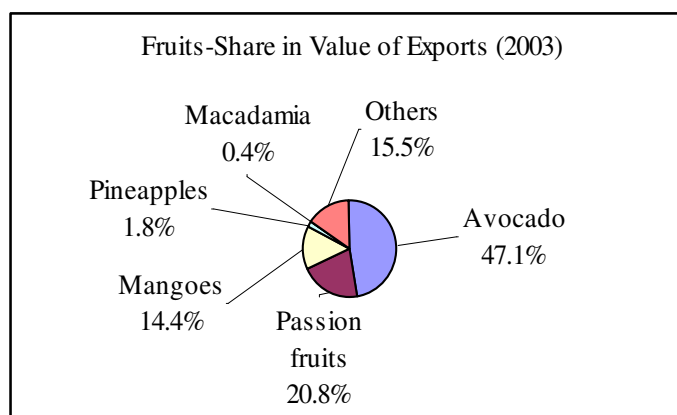
17. At the high end of the market are two main supermarkets – Nakumatt and Uchumi – which sell high quality mangoes to the upper income consumers. This outlet, however, only accounts for less than 5 percent of the mango distributed in Kenya. The open market accounts for 56 percent in urban centres and more than 70 percent in rural areas, while kiosks account for 36 percent of mango sales.

Figure 5: Domestic, regional and international marketing channels for mangoes in Kenya



18. In 2003, fruits earned some Kshs 1.9 billion (US\$24.98 million), representing close to 7 percent of the total value of horticultural exports from Kenya. Mango exports accounted for 14.4 percent of the value of fruit export earnings (Figure 6).

Figure 6: Value of fruit export earnings



Source: Based on data from MOA/HCDA.

19. Mango processing accounts for a negligible share of total production. Only one relatively large-size mango processing firm based in Coast Province processes local products. Other local juice and jam makers import concentrated mangoes mainly from Mauritius, Egypt and South Africa. In principle, therefore, there is potential for increasing the processing of local products. The bulk of local production, however, is of low quality and unsuitable for processing.

Table 4: Export Share of Mango Production in Kenya

Year	Area (ha)	Total Production (tons)	Total		Export	
			Value (‘000 Kshs)	Export Volume (tons)	Value (‘000 Kshs)	percent Export Volume
1992	11 839	90 160	396 959	1 745.17	56 369	2 14
1993	2 357	97 426	671 418	2 348.91	93 956	2 14
1994	2 028	88 129	823 314	2 850.38	131 117	3 16
1995	0 865	89 258	989 309	2 277.17	104 750	3 11
1996	1 143	88 076	846 489	4 245.47	195 291	5 23
1997	3 208	66 707	855 557	2 524.84	195 570	4 23
1998	5 288	150 812	1 550 299	2 505.35	162 848	2 11
1999	15 647	162 322	1 576 933	3 994.76	311 591	2 20
2000	15 027	112 608	5 308 876	2 686.85	118 287	2 22
2001	16 542	179 638	5 366 815	3 166.18	485 353	2 9
2002	16 673	176 504	1 078 928	7 081.00	341 371	4 32
2003	17 268	183 486	1 108 435	2 226.55	273 612	1 25

III. FACTORS PREVENTING THE DEVELOPMENT OF THE MANGO SUPPLY CHAIN

20. Constraints hindering the development of the mango supply chain can be found in all stages of the supply chain. At the farm-level, farmers lack clean planting material, adequate technology and post-harvest handling. Production cycles are too long.

21. There is a generalized shortage of grafted seedlings, hence farmers tend to use inferior, low yielding seedlings. There is also little or no use of fertilizers and pesticides. Poor crop management practice often leads to flower and fruit fall. Pests such as mango seed weevil and fruit fly, and diseases such as anthracnose and powdery mildew constraint productivity. Farmers often lack motorized pumps for pest and disease control.

22. Where mango is harvested only once a year, as in the case of Eastern Province, farmers have diversified to other crops, including passion fruits, melons and seedling production, to smooth their income pattern throughout the year. Oversupply at harvest time is frequent, and this leads to low prices and product losses.

23. Poor post-harvest handling techniques lead to significant losses, which affect returns to farmer and traders. Storage facilities are scarce at farm level, and this forces farmers to sell products immediately after harvest. No collective bargaining takes place on the price, hence individual farmers may be forced to accept unfavourable deals.

24. Poor transport infrastructure is a major constraint for marketing. Production areas are served by inadequately developed roads, which further contribute to post-harvest losses and raising costs.

25. Supply is not well organized with inadequate collection, grading and packing facilities. Hence, quality is not properly remunerated. Information on alternative marketing and product use options is scarce. Access to credit is often poor.

26. Exports opportunities are reduced by inadequate post-harvest/ husbandry control, wrong varieties for sea freight, inadequate sea freight facilities and high air freight costs. Prices are unstable in international markets, and competition from countries like India, Pakistan, Brazil, Mexico and Costa Rica is stiff.

27. Major constraints in processing include insufficient plant capacity and organization of supplies and seasonality. Currently, production is enough to supply factories only for about seven months each year.

28. Natural mango juice is expensive for domestic consumers. Hence, the demand for indigenous varieties and cheaper imported juices is strong. Countries like Mauritius, South Africa and Egypt, which enjoy preferential tariffs under COMESA, compete in the domestic market. Further competition comes from locally manufactured, chemically sweetened mango flavoured drinks.

IV. CONCLUSIONS AND RECOMMENDATIONS

29. Despite the existence of considerable potential and a steady growth over the last decade, the development of the Kenyan mango supply chain is hindered by a number of structural problems. This implies foregone potential income and employment opportunities, as well as reduced availability of fruits and juices.

30. A number of actions need to be undertaken in order to promote the development of the supply chain.

31. Particularly, better quality control could enhance exports of fresh fruits. In the short run, fruits that do not meet export standards may be processed, given that shipping and handling costs are lower for processed products. In the longer term quality and productivity should be enhanced through capacity building, technological applications, improved extension services, and improved plant breeding. In some areas, better quality could also be achieved by adapting existing varieties.

32. Infrastructural development is also key to support the mango sub-sector. In this area, emphasis should be given to storage facilities and transportation. Credit and other services such as farmers' organizations are also important. They may be effective in improving marketing, as well as the interaction with other stakeholders in the production chain.

33. Future work in this the area should focus on value chain analysis through case/country studies. This calls for enhanced cooperation between the Secretariat and the country representatives, to facilitate the collection and organization of data. The Sub-Group is invited to indicate whether it wishes the Secretariat to continue with value chain analysis. If so, then the Sub-Group should urge members to provide the data and other information required to undertake these studies.