

**Table M.2-1 Summary of Infrastructure Improvement Plan**

Facilities	Type B Rupingazi Ngerwe I.S. (Embu District)	Type C Ngomano/Nyangati W.F. (Kirinyaga District)	Type D Nkunjumo W.P. (Meru District)	Type E Ruungu/Karocho I.P. (Tharaka Nithi District)
<b>1. Irrigation &amp; Drainage</b>				
1) Project Type	<b>Improvement</b>	<b>Improvement</b>	<b>Improvement</b>	(Design evaluation)
2) Irrigation System	Open canal with partial pipe conduit and with furrow irrigation	Open earth canal with furrow irrigation	Additional pipeline from upstream new intake site	Open canal system
3) Facilities				
- Intake Weir	-	New construction	New construction	
- Canal/Pipeline	<b>Improvement</b>	<b>Improvement</b>	Additional pipeline	
- Major Structure	Division box	Division box, drops	Valve chamber	
4) Implementation				On-going
- Imple. Mode	<b>Self-help</b>	<b>Self-help</b>	<b>Self-help</b>	Self-help
- Support Agency	NGOs, MOA	NGOs, MOA	NGOs, MOA	NGO
5) O&M Body	<b>Self-help</b>	<b>Self-help</b>	<b>Self-help</b>	Self-help
<b>2. Domestic Water Supply</b>				
1) Project Type	No plan * To be by the existing water supply system operated by NWC&PC	No plan * To be as existing condition using springs & shallow wells	<b>Improvement</b> * To be planned together with irrigation purpose	No plan * To be by the existing boreholes built under SIDA assistance
2) Supply System	-	-	Gravity pipeline	-
3) Facilities	-	-	Storage tank (2)	-
4) Implementation				
- Imple. Mode	-	-	<b>Self-help</b>	-
- Support Agency	-	-	NGOs, MOA	-
5) O&M Body	NWC&PC	Self-help	Self-help	Self-help
<b>3. Access Roads</b>				
1) Project Type	<b>Rehabilitation</b>	No plan	No plan	<b>Rehabilitation</b>
2) Road Plan	* E632 road, L=1.0km (Tarmac pavement) * L=5.3km (Partial rehabilitation)	-	-	* C92 road, L=20.0km * E788 road, L=11.5km * Rural road, L=6.0km
3) Structures	-	-	-	Spillway type bridge (5)
4) Implementation				
- Imple. Mode	Government	-	-	Government
- Main Agency	MPWH	-	-	MPWH/County Council
5) O&M Body	MPWH	MPWH	MPWH	MPWH/community
<b>4. Farm/Village Roads</b>				
1) Project Type	<b>Rehabilitation</b>	<b>Rehabilitation</b>	<b>Rehabilitation</b>	<b>Rehabilitation</b>
2) Road Plan	* L= 1.2 km	* L= 3.2 km	* L= 2.5 km	* L= 3.0 km
3) Structures	None	None	None	None
4) Implementation				
- Imple. Mode	Government	Government	Government	Government
- Main Agency	County Council	County Council	County Council	County Council
5) O&M Body	Community	Community	Community	Community
<b>5. Marketing Facilities</b>				
1) Project Type	No plan	No plan	<b>Improvement</b>	<b>New construction</b>
2) Facilities			Meru market facility	Antena shop/storage, etc.
3) Implementation				
- Imple. Mode			Government	Self-help
- Main/Support Agency			Meru municipal council	NGOs, MOA
4) O&M Body			Meru municipal council	Self-help

**Table M.2-2 Construction Cost on Alternative Study for Rupingazi Ngerwe Irrigation System**

Item	Description	Unit	Unit cost (Ksh)	Alternative -1		Alternative -2		Remarks
				Q'ty	Amount (Ksh)	Q'ty	Amount (Ksh)	
<b>1. Canal/Pipeline</b>								
1) Material cost								
- Conduit pipe	concrete pipe $\phi$ 450mm	m	1,600	1,300	2,080,000	1,300	2,080,000	
- PVC pipe	$\phi$ 200mm, L=6m/no. class-B	no.	4,400	0	0	129	567,600	
- d0	$\phi$ 150mm, L=6m/no. class-B	no.	3,000	0	0	505	1,515,000	
- d0	$\phi$ 100mm, L=6m/no. class-C	no.	2,000	0	0	684	1,368,000	
- d0	$\phi$ 75mm, L=6m/no. class-C	no.	1,400	0	0	200	280,000	
- Hydrant	$\phi$ 12.5mm, G.I. pipe L=6m	no.	800	0	0	60	48,000	
- Fittings			10%	0	208,000		585,860	
	<b>Sub-total</b>				<b>2,288,000</b>		<b>6,444,460</b>	
2) Skilled labour cost.								
3) Transport cost								
	<b>Sub-total of canal</b>		10%		228,800		644,446	
			5%		114,400		322,223	
					<b>2,631,200</b>		<b>7,411,129</b>	
<b>2. Structures</b>								
- Pipeline head box	concrete	no.	30,000	0	0	1	30,000	
- Valve chamber	concrete	no.	5,000	0	0	9	45,000	
- Division box	concrete	no.	30,000	2	60,000	0	0	
	<b>Sub-total of structures</b>				<b>60,000</b>		<b>75,000</b>	
<b>Total direct cost</b>								
					<b>2,691,200</b>		<b>7,486,129</b>	
					100%		278%	

Note: 1) Following works to be provided by Rupingazi Ngerwe Irrigation Association are not included in the above construction cost.

- Pipe laying works other than the work which requires skilled labours.
- Earth canal trimming work.
- Manpower excavation and backfilling for pipeline and structures.

**Table M.2-3 Construction Cost on Alternative Study for Ngomano/Nyangati Irrigation System**

Item	Description	Unit	Unit cost (Ksh)	Alternative -1		Alternative -2		Remarks
				Qty	Amount (Ksh)	Qty	Amount (Ksh)	
1. Intake								
- Intake weir concrete		cu.m	8,000	30	240,000	30	240,000	
- Form work			50%		120,000		120,000	
- Gabion	2.0m * 1.0m * 0.5m	no.	4,100	112	459,200	112	459,200	
- Excavation	By machine	cu.m	150	560	84,000	560	84,000	
- G.I pipe	φ 450mm, L=6.0m	no.	80,000	1	80,000	1	80,000	
- Intake box		no.	30,000	1	30,000	1	30,000	
- Cofferdam	For diversion works		40%	1.s.	405,280	1.s.	405,280	
- Diversion canal	For diversion works		30%	1.s.	303,960	1.s.	303,960	
	<b>Sub-total</b>				<b>1,722,440</b>		<b>1,722,440</b>	
2. Canal								
- Concrete flume		m	500	4,800	2,400,000	0	0	
	<b>Sub-total</b>				<b>2,400,000</b>		<b>0</b>	
3. Structures								
- Division box	Concrete	no.	30,000	2	60,000	2	60,000	
- Drops	H=0.50m/no.	no.	5,000	102	510,000	102	510,000	
	<b>Sub-total</b>				<b>570,000</b>		<b>570,000</b>	
<b>Total direct cost</b>					<b>4,692,440</b>		<b>2,292,440</b>	
					205%		100%	

Note: 1) Following works to be provided by Ngomano/Nyangati Water Furrow Association: are not included in the above construction cost.

- Concrete flume laying works other than the work which requires skilled labours.
- Earth canal trimming work.
- Manpower excavation and backfilling for concrete flume and structures.



**Table M.2-5 Hydraulic Calculation of Canal System for Rupingazi Ngerwe Irrigation Scheme**

1. Open Canal System (Alternative -1)															
Station	Distance (L) (m)	Design flow (Q) (liter/sec)	Canal type	Roughness (N)	Canal gradient (i)	Bottom width (B) (m)	Side slope	Velocity head (Hv) (m)	Water level (W.L. m)	Water depth (m)	Canal bed height (E.L. m)	Ground height (E.L. m)	Velocity (V) (m/sec)	Canal dimension (B * H .m)	Remarks
1) Main canal															
0+0	1,300	63.60	Culvert	0.015	1/773.8	-	-	0.019	1,586.262	0.282	1,585.98	1,587.74	0.607	φ 450mm	Intake box (existing) Concrete pipe
13+00	500	63.60	Earth	0.033	1/312.5	0.50	1:1.0	0.010	1,584.582	0.203	1,584.30	1,584.99	0.446	0.50m * 0.70m	18 drops (H=1.2m), existing Out lateral -A
18+00	18	63.60	Earth	0.033	1/72.0	0.50	1:1.0	0.029	1,570.903	0.134	1,570.70	1,571.67	0.751	0.50m * 1.00m	Out lateral -B
18+18	82	63.60	Earth	0.033	1/37.6	0.50	1:1.0	0.045	1,570.584	0.111	1,570.45	1,571.45	0.941	0.50m * 1.00m	2 drops (H=1.5m), existing To Kanji Kamini stream
19+00									1,566.881		1,566.77	1,567.91			
24+90									1,555.878		1,555.67	1,557.00	0.602	0.30m * 0.50m	Intake at Kanji Kamini stream (existing)
37+00	1,210	63.60	Earth	0.033	1/148.1	0.30	1:1.0	0.019	1,547.708	0.208	1,547.50	1,548.00	0.790	0.30m * 0.50m	Out lateral -C
54+00	1,700	63.60	Earth	0.033	1/70.8	0.30	1:1.0	0.032	1,523.671	0.171	1,523.50	1,524.00	1.072	0.30m * 0.50m	End of main canal
69+00	1,500	63.60	Earth	0.033	1/30.6	0.30	1:1.0	0.059	1,474.636	0.136	1,474.50	1,475.00			
(6,310)															
2) Lateral - A															
0+0	1,200	21.00	Earth	0.033	1/48.6	0.30	1:1.0	0.022	1,570.903	0.083	1,570.70	1,571.67	0.662	0.30m * 0.50m	Sta. 18+00
12+00	(1,200)								1,546.083		1,546.00	1,546.50			End of L-A
3) Lateral - B															
0+0	1,650	50.60	Earth	0.033	1/47.2	0.30	1:1.0	0.038	1,570.584	0.135	1,570.45	1,571.45	0.861	0.30m * 0.50m	Sta. 18+18
16+50	(1,650)								1,535.635		1,535.50	1,536.00			End of L-B
4) Lateral - C															
0+0	1,500	63.60	Earth	0.033	1/44.1	0.30	1:1.0	0.045	1,547.708	0.150	1,547.50	1,548.00	0.939	0.30m * 0.50m	Sta. 37+00
15+00	(1,500)								1,513.650		1,513.50	1,514.00			End of L-C

Cont.

## 2. Pipeline System (Alternative -2)

Station	Distance (L) (m)	Ground height (EL. m)	Pipe centre height (EL. m)	Height difference (m)	Pipe diameter (mm)	Necessary flow (Q) (litter/sec)	Head loss (H <sub>f</sub> ) (m)	Hydraulic gradient (i=H <sub>f</sub> /L) (1/1)	Velocity (V) (m/sec)	Water head (W.L. m)	Effective head (m)	Remarks
1) Main line												
0+0	1,300	1,587.74	1,586.10	1.61	450	50.5	(H <sub>v</sub> ) (0.019)	(i) (1/773.8)	0.576		(water depth) (0.243)	Intake box (existing)
13+00	300	1,584.99	1,584.49	0.59		50.5	(0.009)	(1/312.5)	0.418		(0.187)	Concrete pipe culvert (φ 450mm)
16+00		1,584.40	1,583.90							1,583.90	0.00	Open earth canal, B=0.50m * H=0.70m
18+00	200	1,571.67	1,571.17	12.73	200	43.5	1.543	0.00772	1.397	1,582.36	10.69	PVC pipe
23+70	570	1,561.00	1,560.50	10.67	200	39.1	3.611	0.00633	1.256	1,578.75	17.75	Out L-A
24+90	120	1,557.00	1,556.50	4.00	150	30.2	2.174	0.01812	1.725	1,576.57	19.57	Out L-B
37+00	1,210	1,548.00	1,547.50	9.00	150	30.2	21.923	0.01812	1.725	1,554.65	6.65	Out L-C
54+00	1,700	1,524.00	1,523.50	24.00	150	16.0	9.510	0.00559	0.914	1,545.14	21.14	
69+00	1,500	1,475.00	1,474.50	49.00	100	10.3	26.761	0.01784	1.325	1,518.38	43.38	End of main line
2) Lateral line - A												
0+0	1,200	1,571.67	1,571.17	25.17	75	4.4	18.017	0.01501	66.6	1,582.36	10.69	Sta. 18+00
12+00	(1,200)	1,546.50	1,546.00							1,564.34	17.84	End of L-A
3) Lateral line - B												
0+0	1,100	1,561.00	1,560.50	25.00	100	8.9	14.977	0.01362	73.4	1,578.75	17.75	Sta. 23+70
11+00	(1,100)	1,536.00	1,535.50							1,563.77	27.77	End of L-B
4) Lateral line - C												
0+0	1,500	1,548.00	1,547.50	34.00	100	10.9	29.716	0.01981	50.5	1,554.65	6.65	Sta. 37+00
15+00	(1,500)	1,514.00	1,513.50							1,524.93	10.93	End of L-C

Note: 1) Necessary head for low pressure sprinkler irrigation is assumed to be more than 5 m.

2) Main line from Sta. 0+00 to 16+00 is an open canal system.

Table M.2-6 Hydraulic Calculation of Canal System for Ngomano/Nyangati Water Furrow Project

1/2

Station	Distance (L) (m)	Design flow (Q) (litter/sec)	Canal type	Roughness (N)	Canal gradient (i)	Bottom width (B) (m)	Side slope	Velocity head (Hv) (m)	Water level (W.L. m)	Water depth (m)	Canal bed height (E.L. m)	Ground height (E.L. m)	Velocity (V) (m/sec)	Canal dimension (B * H m)	Remarks
<b>1) Proposed Canal System in Alternative -1</b>															
1) Main canal															
0+0	1,000	69.30	Earth	0.033	1/330	0.30	1:1.0	0.011	1,275.365	0.265	1,275.10	1,275.70	0.463	0.30m * 0.60m	Intake (new)
10+00	1,000	25.00	Earth	0.033	1/365	0.30	1:1.0	0.006	1,272.235	0.161	1,271.97	1,272.57	0.337	0.30m * 0.60m	Out lateral -A
20+00	1,300	9.40	Concrete	0.015	1/185	0.20	1:0.0	0.019	1,269.391	0.077	1,269.23	1,269.80	0.607	0.20m * 0.30m	Out lateral -B 36 drops (H=18m), new End of main canal
33+00	(3,300)								1,244.277		1,244.20	1,245.00			
<b>2) Lateral - A</b>															
0+0	1,300	37.10	Earth	0.033	1/320	0.30	1:1.0	0.008	1,272.235	0.192	1,271.97	1,272.57	0.393	0.30m * 0.60m	Sta. 10+00
13+00	1,000	25.80	Concrete	0.015	1/173	0.20	1:0.0	0.032	1,268.102	0.163	1,267.91	1,268.50	0.793	0.20m * 0.30m	44 drops (H=22m), new
23+00	1,600	18.50	Concrete	0.015	1/130	0.20	1:0.0	0.035	1,240.293	0.112	1,240.13	1,241.00	0.824	0.20m * 0.30m	24 drops (H=12m), new End of L-A
39+00	(3,900)								1,215.932		1,215.82	1,216.50			
<b>3) Lateral - B</b>															
0+0	900	8.50	Concrete	0.015	1/187	0.20	1:0.0	0.018	1,269.391	0.072	1,269.23	1,269.80	0.588	0.20m * 0.30m	Sta. 20+00 End of L-B
9+00	(900)								1,264.492		1,264.42	1,265.00			

Alternative condition: 1) Water application rotation from Monday to Saturday is scheduled by 1/6 areas of each irrigation block.

2) Earth canal is applied up to middle reaches with minimum dimension of b=0.30m, and concrete flume is applied to lower reaches with minimum dimension of b=0.20m.

3) The length of earth canal is 3,300m, and concrete flume canal is 4,800m.

(Cont.)

## 2. Proposed Canal System in Alternative - 2

Station	Distance (L) (m)	Design flow (Q) (litter/sec)	Canal type	Roughness (N)	Canal gradient (i)	Bottom width (B) (m)	Side slope	Velocity head (Hv) (m)	Water level (WL, m)	Water depth (m)	Canal bed height (EL, m)	Ground height (EL, m)	Velocity (V) (m/sec)	Canal dimension (B * H, m)	Remarks
1) Main canal															
0+0	1,000	69.30	Earth	0.033	1/330	0.30	1:1.0	0.011	1,275.365	0.265	1,275.10	1,275.70	0.463	0.30m * 0.60m	Intake (new)
10+00	1,000	69.30	Earth	0.033	1/365	0.30	1:1.0	0.010	1,272.235	0.274	1,271.97	1,272.57	0.440	0.30m * 0.60m	Out lateral -A
20+00	1,300	34.70	Earth	0.033	1/185	0.30	1:1.0	0.011	1,269.504	0.160	1,269.23	1,269.80	0.473	0.30m * 0.60m	Out lateral -B
33+00	(3,300)								1,244.360		1,244.20	1,245.00			36 drops (H=18m), new End of main canal
2) Lateral - A															
0+0	1,300	69.30	Earth	0.033	1/320	0.30	1:1.0	0.011	1,272.235	0.265	1,271.97	1,272.57	0.463	0.30m * 0.60m	Sta. 10+00
13+00	1,000	69.30	Earth	0.033	1/173	0.30	1:1.0	0.017	1,268.175	0.226	1,267.91	1,268.50	0.581	0.30m * 0.60m	44 drops (H=22m), new
23+00	1,600	69.30	Earth	0.033	1/130	0.30	1:1.0	0.021	1,240.356	0.210	1,240.13	1,241.00	0.646	0.30m * 0.60m	24 drops (H=12m), new
39+00	(3,900)								1,216.030		1,215.82	1,216.50			End of L-A
3) Lateral - B															
0+0	900	34.70	Earth	0.033	1/187	0.30	1:1.0	0.011	1,269.504	0.160	1,269.23	1,269.80	0.471	0.30m * 0.60m	Sta. 20+00
9+00	(900)								1,264.580		1,264.42	1,265.00			End of L-B

Alternative condition: 1) Water application rotation from Monday to Saturday is scheduled by irrigation block.  
2) Earth canal is applied to all sections with minimum dimension of b=0.30m.



**Table M.2-7 Hydraulic Calculation of Pipeline for Nkunjumo Water Project**

1/5

Station	Distance (L) (m)	Ground height (EL. m)	Pipe centre height (EL. m)	Height difference (m)	Pipe diameter (mm)	Flow capacity (Q) (litter/sec)	Head loss (Hf) (m)	Hydraulic gradient ( $f=Hf/L$ ) (1/l)	Velocity (V) (m/sec)	Water head (W.L. m)	Effective head (m)	Domestic water demand (litter/sec)	Remarks
1) Main line													
0+0	1,068	1,615.68	1,614.90	26.33	150	25.0	13.641	0.01277	1.428	1,614.90	0.00	5.60	Intake weir (existing)
10+68	332	1,589.07	1,588.57	10.76	100	14.0	10.451	0.03148	1.800	1,601.26	12.19	4.00	Intake box (existing)
14+00	850	1,578.31	1,577.81	51.81	75	9.0	47.961	0.05642	2.058	1,590.81	12.50	2.00	PVC pipe
22+50	450	1,526.50	1,526.00	18.00	75	8.0	20.420	0.04538	1.830	1,542.85	16.35	1.30	Out L-1
27+00	900	1,508.50	1,508.00	36.50	50	2.5	34.207	0.03801	1.288	1,522.43	13.93	0.30	Out L-2
36+00	(3,600)	1,472.00	1,471.50							1,488.22	16.22		End of main line
2) Lateral line - 1													
0+0	700	1,578.31	1,577.81	26.31	50	2.5	26.605	0.03801	1.288	1,590.81	12.50	1.00	Sta. 14+00
7+00	(700)	1,552.00	1,551.50							1,564.20	12.20		End of L-1
3) Lateral line - 2													
0+0	300	1,508.50	1,508.00	9.50	50	2.5	11.402	0.03801	1.288	1,522.43	13.93	0.30	Sta. 27+00
3+00	(300)	1,499.00	1,498.50							1,511.03	12.03		End of L-2

Note: 1) Necessary pressure for sprinkler irrigation is assumed to be more than 10 m considering present irrigation practice.

Cont.

2. Proposed Pipeline System in Alternative 1-a

Station	Distance (L) (m)	Ground height (EL. m)	Pipe centre height (EL. m)	Height difference (m)	Pipe diameter (mm)	Necessary flow (Q) (litter/sec)	Head loss (Hf) (m)	Hydraulic gradient $(i = Hf/L)$ (1/i)	Velocity (V) (m/sec)	Water head (W.L. m)	Effective head (m)	Total water demand (litter/sec)	Existing capacity (litter/sec)	Remarks
1) Main line														
0+0	1,068	1,615.68	1,614.90	26.33	200	48.1	9.926	0.00929	1.545	1,614.90	0.00	73.10	25.00	Intake weir (existing) Intake box (new) PVC pipe
10+68	332	1,589.07	1,588.57	10.76	200	51.6	3.514	0.01058	1.657	1,604.97	15.90	65.60	14.00	
14+00	850	1,578.31	1,577.81	51.81	100	21.9	61.222	0.07203	2.814	1,601.46	23.15	30.90	9.00	Out L-1
22+50	450	1,526.50	1,526.00	18.00	100	12.0	10.650	0.02367	1.543	1,540.24	13.74	20.00	8.00	Out L-2
27+00	900	1,508.50	1,508.00	36.50	63	3.1	16.525	0.01836	1.006	1,529.59	21.09	5.60	2.50	End of main line
36+00	(3,600)	1,472.00	1,471.50							1,513.06	41.06			
2) Lateral line - 1														
0+0	700	1,578.31	1,577.81	26.31	100	14.9	24.726	0.03532	1.916	1,601.46	23.15	17.40	2.50	Sta. 14+00
7+00	(700)	1,552.00	1,551.50							1,576.73	24.73			End of L-1
3) Lateral line - 2														
0+0	300	1,508.50	1,508.00	9.50	50	2.6	12.260	0.04087	1.339	1,529.59	21.09	5.10	2.50	Sta. 27+00
3+00	(300)	1,499.00	1,498.50							1,517.33	18.33			End of L-2

Note: 1) Proposed pipeline is commonly used with existing one for both irrigation and domestic purposes.

## 3. Proposed Pipeline System in Alternative 1-b

Station	Distance (L) (m)	Ground height (E.L. m)	Pipe centre height (E.L. m)	Height difference (m)	Pipe diameter (mm)	Necessary flow (Q) (litter/sec)	Head loss (Hf) (m)	Hydraulic gradient (i=Hf/L) (l/i)	Velocity (V) (m/sec)	Water head (W.L. m)	Effective head (m)	Irrigation water demand (litter/sec)	Remarks
1) Main line													
0+0	1,068	1,615.68	1,614.90	26.33	250	67.5	6.267	0.00587	1.387	1,614.90	0.00	67.50	Intake weir (existing)
10+68	332	1,589.07	1,588.57	10.76	200	61.6	4.876	0.01469	1.978	1,608.63	19.56	61.60	Intake box (new)
14+00	850	1,578.31	1,577.81	51.81	150	28.9	14.196	0.01670	1.650	1,603.76	25.45	28.90	PVC pipe
22+50	450	1,526.50	1,526.00	18.00	100	18.7	24.198	0.05377	2.404	1,589.56	63.06	18.70	Out L-1
27+00	900	1,508.50	1,508.00	36.50	63	5.3	44.569	0.04952	1.718	1,565.36	56.86	5.30	Out L-2
36+00	(3,600)	1,472.00	1,471.50							1,520.79	48.79		End of main line
2) Lateral line - 1													
0+0	700	1,578.31	1,577.81	26.31	100	16.4	29.527	0.04218	2.108	1,603.76	25.45	16.40	Sta. 14+00
7+00	(700)	1,552.00	1,551.50							1,574.23	22.23		End of L-1
3) Lateral line - 2													
0+0	300	1,508.50	1,508.00	9.50	50	4.8	38.115	0.12705	2.471	1,565.36	56.86	4.80	Sta. 27+00
3+00	(300)	1,499.00	1,498.50							1,527.25	28.25		End of L-2

Note: 1) Proposed pipeline is used for irrigation purpose only, and existing one is for domestic use only.

Cont.

## 4. Proposed Pipeline System in Alternative 2-a

Station	Distance (L) (m)	Ground height (EL. m)	Pipe centre height (EL. m)	Height difference (m)	Pipe diameter (mm)	Necessary flow (Q) (litter/sec)	Head loss (HF) (m)	Hydraulic gradient ( $i = HF/L$ ) (l/i)	Velocity (V) (m/sec)	Water head (WL. m)	Effective head (m)	Total water demand (litter/sec)	Existing capacity (litter/sec)	Remarks
1) Main line														
-1+50	150	1,620.29	1,619.80	4.62	250	73.1	1.020	0.00680	1.502	1,619.80	0.00	73.10	0.00	Intake weir (new)
0+0	1,068	1,615.68	1,615.18	26.61	200	48.1	9.926	0.00929	1.545	1,618.78	3.10	73.10	25.00	Intake box (new)
10+68	332	1,589.07	1,588.57	10.76	150	51.6	16.205	0.04881	2.945	1,608.85	19.78	65.60	14.00	PVC pipe
14+00	850	1,578.31	1,577.81	51.81	150	21.9	8.498	0.01000	1.251	1,592.65	14.34	30.90	9.00	Out L-1
22+50	450	1,526.50	1,526.00	18.00	75	12.0	43.233	0.09607	2.743	1,584.15	57.65	20.00	8.00	Out L-2
27+00	900	1,508.50	1,508.00	36.50	50	3.1	50.926	0.05658	1.596	1,540.92	32.42	5.60	2.50	End of main line
36+00	(3,750)	1,472.00	1,471.50							1,489.99	17.99			
2) Lateral line - 1														
0+0	700	1,578.31	1,577.81	26.31	100	14.9	24.726	0.03532	1.916	1,592.65	14.34	17.40	2.50	Sta. 14+00
7+00	(700)	1,552.00	1,551.50							1,567.92	15.92			End of L-1
3) Lateral line - 2														
0+0	300	1,508.50	1,508.00	9.50	50	2.6	12.260	0.04087	1.339	1,540.92	32.42	5.10	2.50	Sta. 27+00
3+00	(300)	1,499.00	1,498.50							1,528.66	29.66			End of L-2

Note: 1) Proposed pipeline is commonly used with existing one for both irrigation and domestic purposes.

Cont.

## 5. Proposed Pipeline System in Alternative 2-b

Station	Distance (L) (m)	Ground height (E.L. m)	Pipe centre height (E.L. m)	Height difference (m)	Pipe diameter (mm)	Necessary flow (Q) (litter/sec)	Head loss (Hf) (m)	Hydraulic gradient (i=Hf/L) (1/i)	Velocity (V) (m/sec)	Water head (W.L. m)	Effective head (m)	Irrigation water demand (litter/sec)	Domestic demand (litter/sec)	Remarks
1) Main line														
-1+50	150	1,620.29	1,619.80	4.62	250	73.1	1.020	0.00680	147.1	1,619.80	0.00	67.50	5.60	Innake weir (new) Innake box (new) PVC pipe
0+0	1,068	1,615.68	1,615.18	26.61	250	67.5	6.267	0.00587	170.4	1,618.78	3.10	67.50		
10+68	332	1,589.07	1,588.57	10.76	150	61.6	22.489	0.06774	14.8	1,612.51	23.44	61.60		
14+00	850	1,578.31	1,577.81	51.81	150	28.9	14.196	0.01670	59.9	1,590.02	11.71	28.90		Out L-1
22+50	450	1,526.50	1,526.00	18.00	100	18.7	24.198	0.05377	18.6	1,575.83	49.33	18.70		Out L-2
27+00	900	1,508.50	1,508.00	36.50	63	5.3	44.569	0.04952	20.2	1,551.63	43.13	5.30		End of main line
36+00	(3,750)	1,472.00	1,471.50							1,507.06	35.06			
2) Lateral line - 1														
0+0	700	1,578.31	1,577.81	26.31	150	16.4	4.099	0.00586	170.8	1,590.02	11.71	16.40		Sta. 14+00
7+00	(700)	1,552.00	1,551.50							1,585.93	33.93			End of L-1
3) Lateral line - 2														
0+0	300	1,508.50	1,508.00	9.50	50	4.8	38.115	0.12705	7.9	1,551.63	43.13	4.80		Sta. 27+00
3+00	(300)	1,499.00	1,498.50							1,513.51	14.51			End of L-2

Note: 1) Proposed pipeline is used for irrigation purpose only, and existing one is for domestic use only.

**Figure M.2-1 Irrigation System Comparison among Alternatives for Rupingazi Ngerwe Irrigation Scheme**

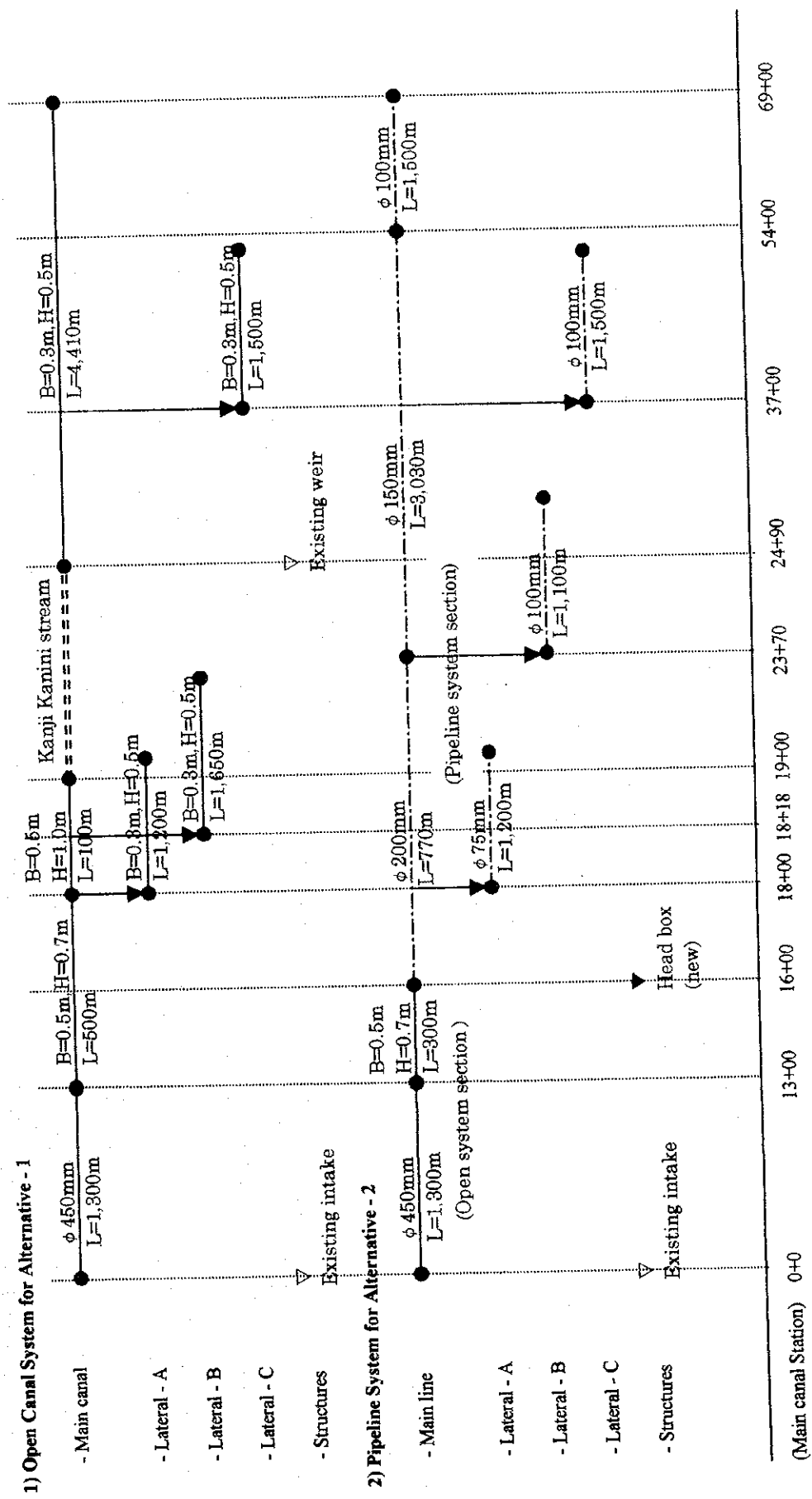
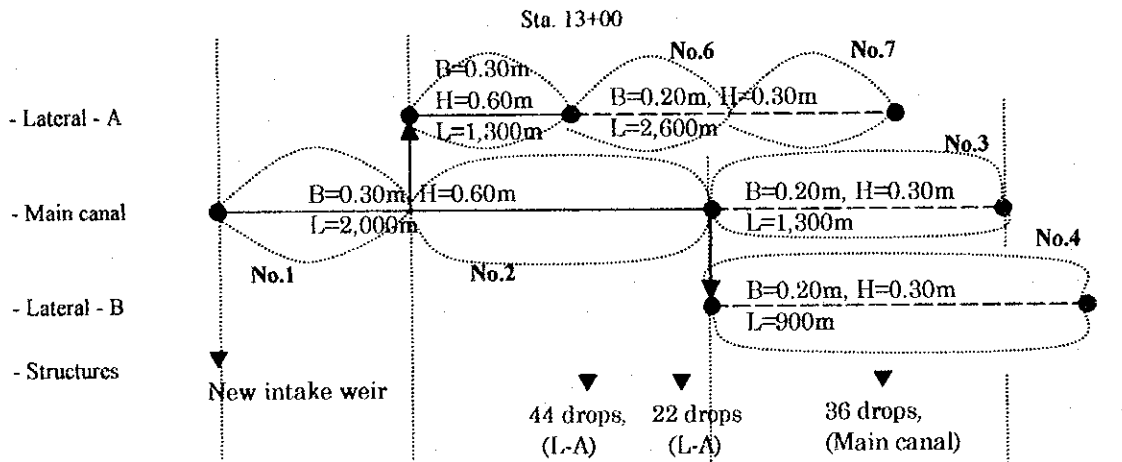


Figure M.2-2

Canal System Comparison among Alternatives for Ngomano/Nyangati Water Furrow Project

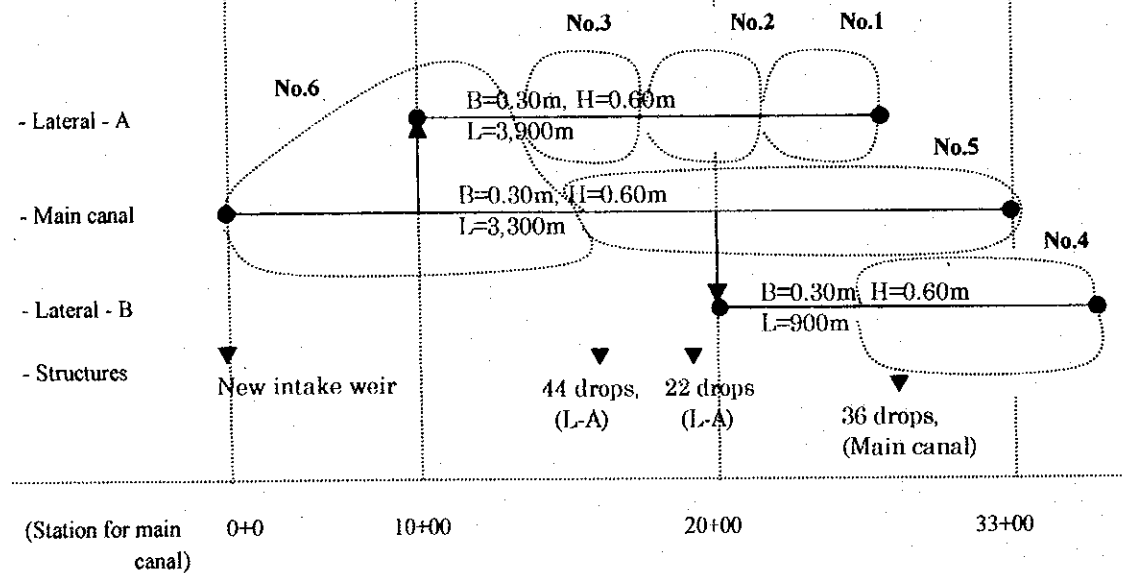
1) Open Canal System for Alternative – 1

(Water application rotation from Monday to Saturday is scheduled by 1/6 areas of each irrigation block)



2) Open Canal System for Alternative – 2

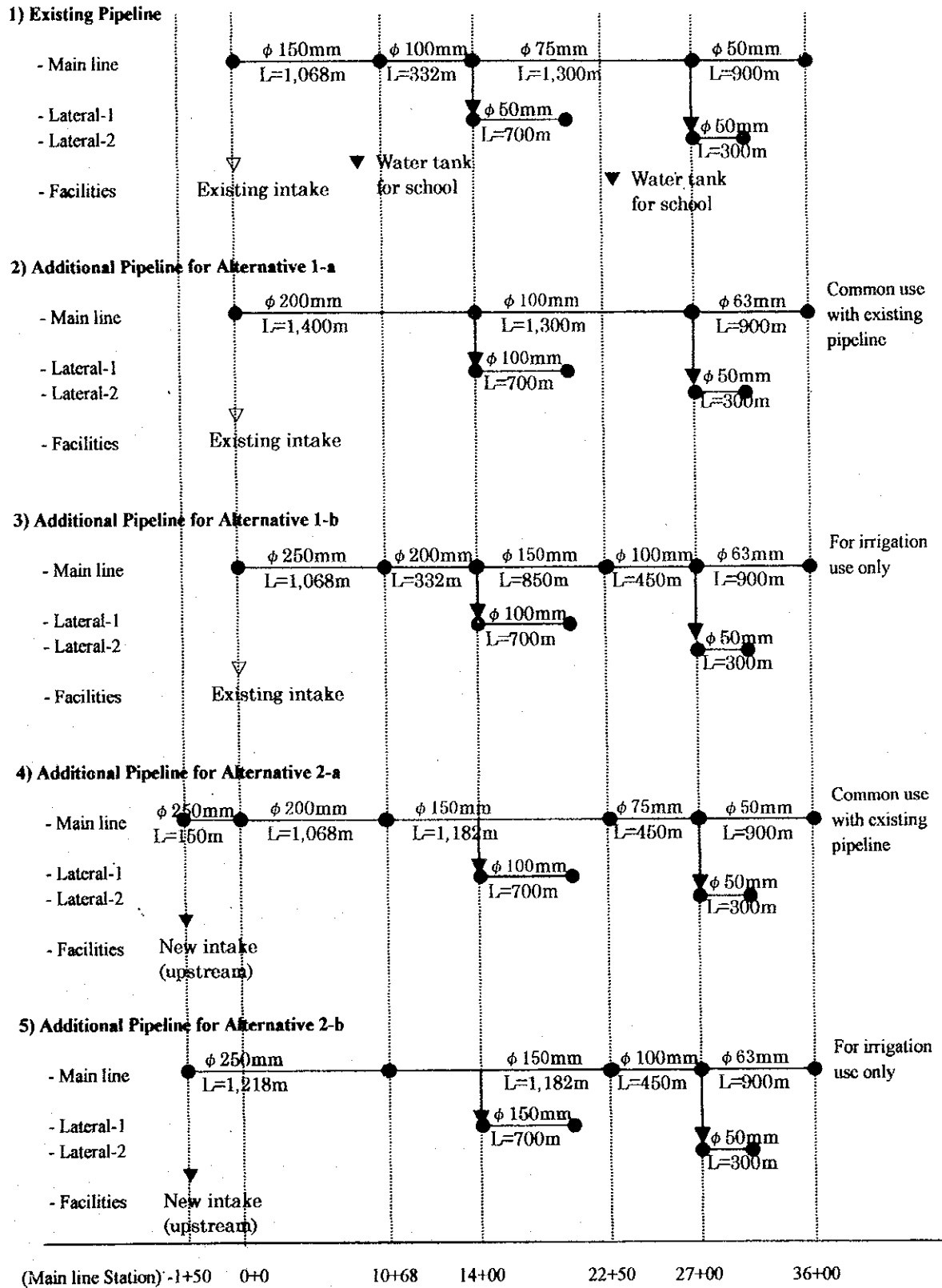
(Water application rotation from Monday to Saturday is scheduled by irrigation block)



- : Earth canal
- - - - - : Concrete flume
- No.1 : Irrigation block & number

Figure M.2-3

Pipeline System Comparison among Alternatives for Nkunjumo Water Project





## **ANNEX N**

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Figure N.1-1 Horticultural Production Areas in Kenya

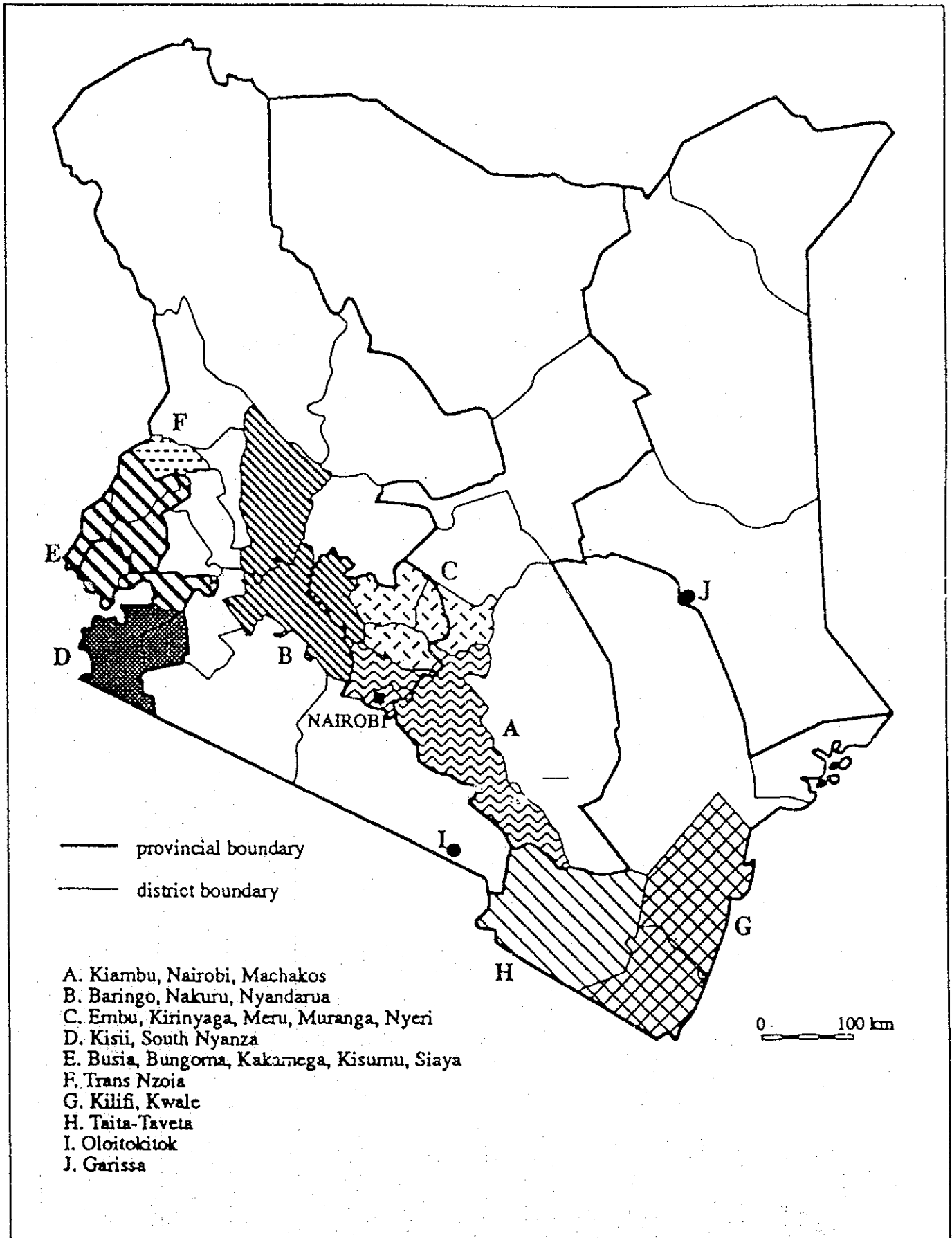


Table N.1-1 Horticultural Production Areas in Kenya

Production Area	Altitude	Type of Production	Major Produce		Minor Produce	Fruits	Favorable aspects	Negative aspects
			Domestic	Export				
A Kiambu, Thika, Machakos, Makeni	1300-2400m 800-1600m	rained : (1500-2000mm) irrigated : Yatta, Kibwezi (600-1000mm)	cabbage, carrot, w.potato, kale, spring onion, tomato	french bean, brinjar, okra, capsicum, chilli, karella, rhubarb, cuciflowers	broccoli, pea, brussels sprout, cauliflower, courgette, lettuce, spinach, rhubarb chinese cabbage	mango, citrus, papaw, ripe banana, pipeapple, passion fruit, avocado	- Improved tarmac road network in Kiambu - Lower transport costs due to distance - Accessibility to retail markets in Nairobi - Processing facilities at Limuru, Yatta, Machakos and Kibwezi	- Lack of reliance among communities especially in Kiambu - Highest labor costs in Kenya
B Baringo, Nyandarua, Nakuru	2100-2800m Lake Naivasha 1900m Lake Baringo 1000m	rained : Melo, Nayindama (1200-1800mm) irrigated : Naivasha, Baringo (400-600mm)	cabbage, carrot, w.potato, kale, spring onion, garden pea	capsicum, chilli, courgette, cuciflowers	brussels sprout, cauliflower, courgette, lettuce, cucumber	plum, apple, pear	- Lower production prices due to scale - Lower temperature - Private company with export routes	- Environment issues for Lake Naivasha, Nakuru, Baringo and Elementaita - Limited rainfall
C Nyambene, Tharaka-Nithi, Nyeri, Meru, Kirinyaga, Muranga	800-2500m	rained : (1000-2000mm) irrigated : (400-800mm)	cabbage, carrot, w.potato, kale, dry bulb onion, garden pea	french bean, snowpea, snap pea, brinjar, capsicum, karella, okra, miraa herb		banana, orange, papaw, pipeapple, passion fruit, avocado	- Higher rainfall - Productive soil conditions - Higher population density for local consumption - Processing facilities at Nkubu, Mwca and Sagana	- Unimproved road network - Small scale in production
D Kisii, South Nyanza	1100-2200m	rained : Kisii (1200-2100mm) S. Nyanza (700-1800mm)	cabbage, kale, dry bulb onion, tomato			banana	- Higher rainfall - Productive soil conditions	- Far distance to Nairobi and Mombasa - Few public investment and services - Banana imports from Uganda - Lack of postharvest facilities
E Busia, Siaya, Kisumu	1100-1500m 1200-2000m	rained : Busoga, Busia, Kakamega (1100-2000mm) Kisumu, Siaya (700-1800mm) irrigated : Kano plain (mainly for sugarcane and rice)	cabbage, kale, spring onion, tomato	french bean for tinning		mango, banana, passion fruit, orange	- Higher rainfall - Productive soil conditions - Higher population density for local consumption - Open of Moi International Airport	- Unimproved road network - Few public investment and services - Lack of postharvest facilities
F Trans-Nzoia	1600-2200m	rained : (900-1400mm) irrigated : limited in large-scale farming			mushroom	citrus, apple, avocado, lychee	- Strong community relation - Lower production prices due to scale - Open of Moi International Airport	- Lack of postharvest facilities - Far distance to Nairobi and Mombasa
G Kilifi, Kwale	0-500m	rained : (400-1400mm) irrigated : limited areas	brinjar, onion, capsicum, tomato			mango, citrus, cashew nut, tamarind	- Accessibility to Mombasa Market - Accessability to Mombasa Port for seafreight for mango - High rainfall	- Unimproved road network - Few public investment and services - Lack of postharvest facilities
H Taita-Taveta	600-1000m Taita hills : 1200-1700m	rained : Taita Hills (800-1500mm) irrigated : Voi (400-600mm)	cabbage, carrot, kale, onion, tomato			banana, melon	- Accessibility to Mombasa Market	- Lower rainfall in Voi - Lack of postharvest facilities
I Oloitokitok	1800-2000m	irrigated : (600-800mm) limited areas	onion, tomato					- Unimproved road to AI - Lack of postharvest facilities - Imports from Tanzania
J Garissa	200-300m	irrigated : (250-500mm) limited areas				banana, citrus, melon	- Sufficient water source	- High transport cost - Lack of postharvest facilities - High farminput cost

Table N.1-2 Agroclimatic Aspects

District	Geographical Location	Climate Type	Agroclimatic Zone			Temperature Zone				General Description		
			Average Annual Rainfall Range (mm)	Average Annual Potential Evaporation Range (mm)	r/E (%)	Classification	Typical vegetation	Mean Annual Temperature (°C)	Classification		Night Forest	Altitude (m)
Nyeri	Nyeri Town	III-4	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	18-20	warm temperate	none	1500-1850	midlands
	Gatarkwa	IV-5	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland and bushland	16-18	cool temperate	very rare	1850-2150	lower highlands
	Kaburu	II-6	1000-1600	1300-2100	65-80	sub-humid	moist-dry forest	14-16	fairly cool	rare	2150-2450	lower highlands
	Kahingaini	III-5	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	16-18	cool temperate	very rare	1850-2150	lower highlands
	Kairuthi	I-5	1100-1700	1200-2000	80	humid	moist forest	16-18	cool temperate	very rare	1850-2150	lower highlands
	Karatina	II-4	1000-1600	1300-2100	65-80	sub-humid	moist-dry forest	18-20	warm temperate	none	1500-1850	midlands
Kirinyaga	Naro Moru	V-5	450-900	1650-2300	25-40	semi-arid	bushland	16-18	cool temperate	very rare	1850-2150	lower highlands
	Othaya	I-4	1100-1700	1200-2000	80	humid	moist forest	18-20	warm temperate	none	1500-1850	midlands
	Kerugoya	II-3	1000-1600	1300-2100	65-80	sub-humid	moist-dry forest	20-22	fairly warm	none	1200-1800	midlands
	Castle Forest	I-6	1100-1700	1200-2000	80	humid	moist forest	14-16	fairly cool	rare	2150-2450	lower highlands
	Kagumo	I-4	1100-1700	1200-2000	80	humid	moist forest	18-20	warm temperate	none	1500-1850	midlands
	Kutus	III-3	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	20-22	fairly warm	none	1200-1800	midlands
Embu	Sagana	III-3	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	20-22	fairly warm	none	1200-1800	midlands
	Thiba	IV-3	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland and bushland	20-22	fairly warm	none	1200-1800	midlands
	Embu Town	III-3	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	20-22	fairly warm	none	1200-1800	midlands
	Irangi	I-5	1100-1700	1200-2000	80	humid	moist forest	16-18	cool temperate	very rare	1850-2150	lower highlands
	Kanga	IV-1	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland/bushland	24-30	hot	none	0-900	lowlands
	Runyenyis	II-3	1000-1600	1300-2100	65-80	sub-humid	moist-dry forest	20-22	fairly warm	none	1200-1800	midlands
Mberere	Siakago	IV-2	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland/bushland	22-24	warm	none	900-1200	midlands
	Isihara	I-4	1100-1700	1200-2000	80	humid	moist forest	18-20	warm temperate	none	1500-1850	midlands
	Kiritiri	IV-2	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland/bushland	22-24	warm	none	900-1200	midlands
	Mashamba	V-2	450-900	1650-2300	25-40	semi-arid	bushland	22-24	warm	none	900-1200	midlands
	Chuka	I-3	1100-1700	1200-2000	80	humid	moist forest	20-22	fairly warm	none	1200-1800	midlands
	Chogoria	I-4	1100-1700	1200-2000	80	humid	moist forest	18-20	warm temperate	none	1500-1850	midlands
Tharaka Nithi	Gatunda	IV-1	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland/bushland	24-30	hot	none	0-900	lowlands
	Kalengachini	VI-1	300-550	1900-2400	15-25	arid	bushland/scrubland	24-30	hot	none	0-900	lowlands
	Tunyani	III-2	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	22-24	warm	none	900-1200	midlands
	Chikariga	IV-1	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland/bushland	24-30	hot	none	0-900	lowlands
	Meru Town	I-4	1100-1700	1200-2000	80	humid	moist forest	18-20	warm temperate	none	1500-1850	midlands
	Magutumi	II-2	1000-1600	1300-2100	65-80	sub-humid	moist-dry forest	22-24	warm	none	900-1200	midlands
Meru	Giaki	II-2	1000-1600	1300-2100	65-80	sub-humid	moist-dry forest	22-24	warm	none	900-1200	midlands
	Mitunguu	III/II-2	800-1400	800-1400	50-65	semi-humid	dry forest/moist woodland	22-24	warm	none	900-1200	midlands
	Nkubuu	I-3	1100-1700	1200-2000	80	humid	moist forest	20-22	fairly warm	none	1200-1800	midlands
	Timau	IV-6	600-1100	1550-2200	40-50	semi-humid to semi-arid	dry woodland/bushland	14-16	fairly cool	rate	2150-2450	lower highlands
	Mau	I-5	1100-1700	1200-2000	80	humid	moist forest	16-18	cool temperate	very rare	1850-2150	lower highlands
	Mukinduni	I-4	1100-1700	1200-2000	80	humid	moist forest	18-20	warm temperate	none	1500-1850	midlands
Nyambene	Lembolio	V-2	450-900	1650-2300	25-40	semi-arid	bushland	22-24	warm	none	900-1200	midlands

Source : Agroclimatic Zone Map of Kenya



Figure N.1-2 Classification of Marketing and Regional Evaluation from Viewpoints of Farmers

	Nyeri	Kirinyaga	Embu	Mberere	Tharaka Nithi	Meru	Nyambene									
	Kimi E.& Mathira	Other Divisions	Mwea	India, Gichugu	All Divisions	Areas along B7	Other Areas	Areas along B6	Other Areas	Timau	Areas along B6	Other Areas	Igembe East	Other Areas in Nyambene Hills	Northern Grazing Areas	
<b>Limited marketing channels or lower pricing at farmgate</b>																
Lack of outer information	2	2	3	2	2	1	1	1	1	3	2	1	3	1	1	
Lack of detail pricing information on newspaper and radio programme	1	2	2	2	2	1	1	1	1	2	1	1	1	1	1	
Infrequent extension services	2	2	3	2	2	1	1	1	1	4	2	1	3	1	1	
Bargaining produce	2	3	3	3	2	1	1	1	1	3	2	1	5	1	1	
Poverty																
Ignorance of prevailing farmgate prices in neighbouring areas																
(Outer information : variety, production technique, price fluctuation, seed supply, pesticide, fertilizer, MRLs, buyer, grading, storing, market demands in volume and quality, weather forecasting, marketing route after farmgate, Nairobi retailers markets, weighing, etc.)																
Weakening farmers power or lack of farmers' marketing groups / cooperatives	3	2	2	2	2	2	-	-	-	3	2	-	3	-	-	
Infighting among member farmers for decision making	3	2	2	2	1	2	-	-	-	3	2	-	3	-	-	
Unclear handling of members' funds	2	2	2	2	1	2	-	-	-	2	2	-	2	-	-	
Dishonest middlemen with weak farmers' position	2	2	3	2	2	3	-	-	-	3	2	-	3	-	-	
Lack of leadership and management skill	3	3	2	3	2	2	-	-	-	4	3	-	3	-	-	
Unimproved market facilities (including cooling facilities)	2	3	3	3	2	2	1	1	1	3	2	1	2	1	1	
Huge postharvest losses in quality	2	3	4	4	2	2	1	1	1	5	4	1	2	1	1	
Losing of information obtaining chances	2	3	3	3	3	2	1	1	1	3	2	1	2	1	1	
Low competitiveness among middlemen																
Difficulty to participate local markets																
Lack of precooling and cold storage facilities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
No business chance to adapt seasonal fluctuation																
No alternative to negotiate other buyers																
Lack of postharvest facilities and knowledge in grading (excluding cooling facilities)	2	2	2	2	1	1	1	1	1	3	2	1	2	1	1	
Huge postharvest losses in quality and quantity	2	2	1	2	1	1	1	1	1	4	2	1	2	1	1	
No attractiveness for buyers	3	3	3	3	2	2	1	1	1	5	2	2	3	1	1	
Irregular buyers' coming and huge rejects																
Lack of funds to construct facilities within farmers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Lack of measure to drought in community level	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Difficulty in production	2	2	2	2	2	1	1	1	1	3	2	1	1	1	1	
Lack of informed decision making to cultivate crops, when, what and how	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Low water availability	3	2	4	3	2	1	1	1	1	3	2	1	1	1	1	
Unstable supply	2	2	3	2	2	1	1	1	1	4	2	1	2	1	1	
Irregular buyers' visiting																
Losing of selling chance																
High costs of farminputs	2	2	2	2	2	2	1	2	1	2	1	1	1	1	1	
Lack of knowledge of chemical application	2	3	2	3	2	2	1	1	1	4	1	1	2	1	1	
Risk of producing export crops especially asian vegetables	-	-	2	-	-	1	1	-	1	-	-	1	-	1	-	
Transaction with middlemen	2	2	2	2	2	1	1	1	1	4	1	1	2	1	-	
No information provision to farmers	2	2	3	3	2	1	1	1	1	4	1	1	2	1	-	
Discounting produce with violating transaction	2	3	3	3	2	1	1	1	1	4	1	1	3	1	-	
No reliance to farmers in continuous purchase	1	1	1	1	1	1	1	1	1	4	1	1	1	1	-	
None or delay payment for export produce	1	1	1	1	1	1	-	1	-	4	1	1	3	1	-	
Disadvantage due to poor road infrastructure	2	3	3	4	3	3	1	3	1	4	3	1	3	1	1	
Huge postharvest losses in quality	2	3	3	4	3	3	1	3	1	4	3	1	2	2	1	
No buyers in rain season	2	3	3	4	3	4	1	3	1	5	3	1	4	1	1	
High transport costs (distance to Nairobi/ major markets) and heavy labour input	3	4	4	4	3	3	1	3	1	3	3	1	1	1	1	
Lower competitiveness between among productive areas including Tanzania																

N.B. The evaluation shows the relative situation ranked by '5 excellent', '4 relatively good', '3 fair', '2 relatively poor', '1 poor' and '-' no adaptation'.

Figure N.1-3 Classification of Marketing Constrains from Viewpoints of Buyers

Constrains on farmers	No reliance to farmers
	Limited contract farming or farminput credits
	Shifting to self-production but limited in large-scale exporters
	Lack of producing assurance especially in hygiene and MRLs
	Poor quality/quantity of produce
	Lack of postharvest facilities
Constrains on infrastructure	Lack of harvesting and grading technique which required for market demands
	Underdeveloped market facilities and operation
	Lack of information exchange opportunities
	Lower quality of produce
	No roofing and dusty ground
	Hygiene
	Lack of pure water for cleaning
	Lack of toilet facilities
	Limited space of loading
	Mixture of retailers and wholesalers found in Nyeri and Nairobi Wakulima Markets
	Losing of labour input
	Losing of chance to sell at highest price in Nairobi markets (7:00-8:00am)
Constrains on circumstances	High transport costs
	Poor road infrastructure
	Making transport costs higher
	Losing of quality by damage and dust
	Unstable production of farmers
	No measure to know producing information
Constrains on among traders	No telephone or wireless equipment
	Excessive cess to pay local government and police
	Price fluctuation
	Lack of storage facilities
	Drought (= Huge increased maize price)
	Increasing prices of potato and dry beans but supply is limited
	Kenyan eating habits
	Consumable vegetables limited in potato, onion, kale, cabbage, tomato, carrot, spring onion, okra & dry beans, recently spinach, leek, avocado & aubergine
	No use of pepper due to food taboos
	Lower consumption of fruits
Lack of cold chain facilities	
High price of perishable fruits	
Constrains on among traders	Losing of competitiveness in EU markets especially in green beans with Zimbabwe, Senegal, etc.
	Higher exchange rate of local currency
	Limited space and higher costs of air freight
Constrains on among traders	No reliable relations between middlemen and wholesalers, retailers, exporters & processing companies
	No system for detail imformation in volume and price provided by retail markets
	Braking of contracted relationship with farmers between exporters

Figure N.1-4 Development Target in Horticultural Marketing

District / Division	Target Category of Produce	Available Resources	Short Term (5 years)	Medium Term (10 years)	Long Term (15 years)
Nyeri District - Kiari East & Mathira Divisions	Self-sufficient Domestic Export	<ul style="list-style-type: none"> <li>- Long experience in horticultural production</li> <li>- Population pressure for local consumption</li> <li>- Accessibility to Nyeri, Karatina markets</li> <li>- High literacy ratio</li> </ul>	<ol style="list-style-type: none"> <li>1 Reconstruct to small units of farmers' marketing groups</li> <li>2 Construction of charcoal grading shed with water supply</li> <li>3 Participation to Auction through Sagana Satellite Depots</li> <li>4 Extension services including MRLs for green beans</li> <li>5 Provision of producing information to buyers</li> </ol>	<ol style="list-style-type: none"> <li>1 Participant to Nyeri/Karatina Markets with its improvement = enlarging farmers' position in transaction</li> <li>2 Participation to Auction through Sagana Satellite Depot</li> <li>3 Extension of high quality cabbage &amp; onion seeds</li> <li>4 Bulk purchase of farminputs</li> </ol>	<ol style="list-style-type: none"> <li>1 Direct sale to Nairobi/Mombasa and contract farming with supermarkets</li> <li>2 Outflower production and grading technique</li> <li>3 Storages to secure food supply to meet population increment</li> </ol>
	Self-sufficient Domestic	<ul style="list-style-type: none"> <li>- Population pressure for local consumption</li> <li>- Accessibility to Nyeri, Karatina markets</li> <li>- High literacy ratio</li> </ul>	<ol style="list-style-type: none"> <li>1 Reconstruct to small units of farmers' marketing groups</li> <li>2 Construction of charcoal grading shed with water supply</li> <li>3 Participation to Auction through Sagana Satellite Depots</li> <li>4 Extension services including MRLs</li> <li>5 Provision of producing information to buyers</li> </ol>	<ol style="list-style-type: none"> <li>1 Participant to Nyeri/Karatina Markets with its improvement = enlarging farmers' position in transaction</li> <li>2 Utilization by farmers' groups and construction of cold storage at Karatina</li> <li>3 Roofing and concrete flooring of local markets</li> <li>4 Bulk purchase of farminputs</li> </ol>	<ol style="list-style-type: none"> <li>1 Storages to secure food supply to meet population increment</li> </ol>
Kericho District - Mwea Division	Self-sufficient Domestic Export	<ul style="list-style-type: none"> <li>- Water availability</li> <li>- Distance to Nairobi</li> <li>- OECF project for export</li> <li>- Accessibility to Wanguru, Makutano markets</li> </ul>	<ol style="list-style-type: none"> <li>1 Reconstruct to small units of farmers' marketing groups</li> <li>2 Participation to Auction through Mwea Satellite Depots</li> <li>3 Extension services including MRLs for asian vegetables</li> </ol>	<ol style="list-style-type: none"> <li>1 Diversification of asian vegetables</li> <li>2 Roofing and concrete flooring of local markets</li> <li>3 Bulk purchase of farminputs</li> </ol>	<ol style="list-style-type: none"> <li>1 Diversification shifting from single-crop of rice to horticultural produce</li> </ol>
	Self-sufficient Domestic Export	<ul style="list-style-type: none"> <li>- Distance to Nairobi</li> <li>- Long experience in horticultural production</li> <li>- Population pressure for local consumption</li> <li>- OECF project for export</li> <li>- Name value in tomato</li> <li>- Accessibility to many markets (Karatina, Katus, Kagio, Baricho, Kerugoya)</li> </ul>	<ol style="list-style-type: none"> <li>1 Reconstruct to small units of farmers' marketing groups</li> <li>2 Construction of charcoal grading shed with water supply</li> <li>3 Participation to Auction through Sagana Satellite Depots</li> <li>4 Extension services including MRLs for green beans</li> </ol>	<ol style="list-style-type: none"> <li>1 Participant to Nyeri/Karatina Markets with its improvement = enlarging farmers' position in transaction</li> <li>2 Utilization by farmers' groups and construction of cold storage at Karatina for cabbage, onion &amp; tomato</li> <li>3 Roofing and concrete flooring of local markets</li> <li>4 Bulk purchase of farminputs</li> </ol>	<ol style="list-style-type: none"> <li>1 Direct sale to Nairobi/Mombasa and contract farming with supermarkets</li> <li>2 Storages to secure food supply to meet population increment</li> </ol>
Embu District - All Divisions	Self-sufficient Domestic Export	<ul style="list-style-type: none"> <li>- Distance to Nairobi</li> <li>- Accessibility to Embu, Runyenjes markets</li> </ul>	<ol style="list-style-type: none"> <li>1 Reconstruct to small units of farmers' marketing groups specially in Mayata &amp; a part of Runyenjes Divisions</li> <li>2 Construction of charcoal grading shed with water supply</li> <li>3 Participation to Auction through Mwea Satellite Depots due to the past collapsed relation with exporters</li> <li>4 Extension services including MRLs for green beans</li> </ol>	<ol style="list-style-type: none"> <li>1 Mongo export promotion to Dutch market</li> <li>2 Marketing chances in areas ; cabbage, potato, kale</li> </ol>	<ol style="list-style-type: none"> <li>1 Balanced production for domestic and self-sufficiency with export produce</li> <li>2 Storages to secure food supply to meet population increment</li> </ol>
	Self-sufficient Domestic	<ul style="list-style-type: none"> <li>- Land scale</li> <li>- Distance to Nairobi</li> <li>- Accessibility to Embu market</li> </ul>	<ol style="list-style-type: none"> <li>1 Reconstruct to small units of farmers' marketing groups</li> <li>2 Construction of charcoal grading shed with water supply</li> </ol>	<ol style="list-style-type: none"> <li>1 Participation to Auction through Yata or Mwea Satellite Depot</li> <li>2 Extension services for asian vegetables</li> </ol>	<ol style="list-style-type: none"> <li>1 Melon production but only in irrigated areas with charcoal grading shed</li> <li>2 Marketing groups to meet migrants from Kininyaga</li> </ol>
Mberere District - Areas along B7	Self-sufficient Domestic	<ul style="list-style-type: none"> <li>- Land scale</li> <li>- Distance to Nairobi</li> <li>- Accessibility to Embu market</li> </ul>	<ol style="list-style-type: none"> <li>1 Production and stock of dry beans</li> </ol>	<ol style="list-style-type: none"> <li>1 Marketing chances in areas ; potato, but limited in volume</li> </ol>	<ol style="list-style-type: none"> <li>1 Conquering malnutrition by cultivation of dry beans and leaf vegetables</li> </ol>
	Self-sufficient	<ul style="list-style-type: none"> <li>- Land scale</li> </ul>	<ol style="list-style-type: none"> <li>1 Production and stock of maize, dry beans &amp; root crops</li> </ol>	<ol style="list-style-type: none"> <li>1 Promotion of marketing groups</li> <li>2 Marketing chances in areas ; cabbage, kale, tomato</li> </ol>	<ol style="list-style-type: none"> <li>1 Conquering poverty not to bargain their produce</li> <li>2 Efficient distribution of stable foods</li> </ol>
Tharaka Nithi District - Areas along B6	Self-sufficient Domestic Export	<ul style="list-style-type: none"> <li>- Accessibility to Chuka, Chogoria markets</li> </ul>	<ol style="list-style-type: none"> <li>1 Access to Embu Market (Chuka &amp; Chogoria Markets are limited in trading volume)</li> <li>2 Stable supply of fbeans to canner (Chiambaraga Irrigation Scheme)</li> </ol>	<ol style="list-style-type: none"> <li>1 Establishment of reliance with conscious exporters, finally conducting stable profits</li> </ol>	<ol style="list-style-type: none"> <li>1 Exporting directly by farmers' groups</li> <li>2 Outflower production</li> </ol>
	Self-sufficient	<ul style="list-style-type: none"> <li>- Land scale</li> </ul>	<ol style="list-style-type: none"> <li>1 Production and stock of maize, dry beans &amp; root crops</li> </ol>	<ol style="list-style-type: none"> <li>1 Enforcing the MERU BRAND for root crops in Nairobi markets</li> <li>2 Extension and production of high quality of potato seed</li> </ol>	<ol style="list-style-type: none"> <li>1 Direct sale to Nairobi/Mombasa and contract farming with supermarkets</li> <li>2 Storages to secure food supply to meet population increment</li> </ol>
Meru District - Timau	Export	<ul style="list-style-type: none"> <li>- Experiences of export of green beans</li> </ul>	<ol style="list-style-type: none"> <li>1 Understanding of MRLs</li> <li>2 Contract farming</li> <li>3 Participant to Meru Market with the facility improvement</li> </ol>	<ol style="list-style-type: none"> <li>1 Diversification of asian vegetables</li> </ol>	<ol style="list-style-type: none"> <li>1 Harmonizing pasturage and been production with somali people</li> </ol>
	Self-sufficient Domestic Export	<ul style="list-style-type: none"> <li>- Population pressure for local consumption</li> <li>- OECF project for export</li> <li>- Name value in red potato</li> <li>- Water availability</li> <li>- Accessibility to Meru, Nkubu markets</li> </ul>	<ol style="list-style-type: none"> <li>1 Participation to Auction through Nkubu Satellite Depot</li> <li>2 Construction of charcoal grading shed with water supply</li> <li>3 Extension services including MRLs for green beans</li> <li>4 Participant to Meru Market with the facility improvement</li> <li>5 Leadership training to manage resources available</li> </ol>	<ol style="list-style-type: none"> <li>1 Enforcing the MERU BRAND for root crops in Nairobi markets</li> <li>2 Extension and production of high quality of potato seed</li> </ol>	<ol style="list-style-type: none"> <li>1 Direct sale to Nairobi/Mombasa and contract farming with supermarkets</li> <li>2 Storages to secure food supply to meet population increment</li> </ol>
Other areas in Nyambene Hills	Self-sufficient Domestic Export (Mitunguu)	<ul style="list-style-type: none"> <li>- Population pressure for local consumption</li> <li>- Water availability</li> <li>- Mitunguu</li> </ul>	<ol style="list-style-type: none"> <li>1 Participation to Auction through Nkubu Satellite Depots</li> <li>2 Extension services including MRLs for asian vegetables</li> <li>3 Participant to Meru Market with the facility improvement</li> </ol>	<ol style="list-style-type: none"> <li>1 Marketing information obtaining in Meru and other areas</li> <li>2 Salinity improvement for miraa herb grading &amp; packing</li> </ol>	<ol style="list-style-type: none"> <li>1 Construction of precooling facilities</li> </ol>
	Self-sufficient	<ul style="list-style-type: none"> <li>- Stable demands of miraa herb in Nairobi, Somali &amp; Yemen</li> </ul>	<ol style="list-style-type: none"> <li>1 Avoidance of soil erosion for continuous miraa herb production</li> </ol>	<ol style="list-style-type: none"> <li>1 Marketing information obtaining in Meru and other areas</li> </ol>	<ol style="list-style-type: none"> <li>1 Storages to secure food supply to meet population increment</li> </ol>
Nyambene District - Igembe East Division	Domestic Export	<ul style="list-style-type: none"> <li>- Stable demands of miraa herb in Nairobi, Somali &amp; Yemen</li> </ul>	<ol style="list-style-type: none"> <li>1 Production and stock of maize, dry beans &amp; root crops</li> <li>2 Grouping farmers by study tour to developed group</li> </ol>	<ol style="list-style-type: none"> <li>1 Marketing information obtaining in Meru and other areas</li> </ol>	<ol style="list-style-type: none"> <li>1 Storages to secure food supply to meet population increment</li> </ol>
	Self-sufficient	<ul style="list-style-type: none"> <li>- Land scale</li> </ul>	<ol style="list-style-type: none"> <li>1 Production and stock of maize, dry beans &amp; root crops</li> </ol>	<ol style="list-style-type: none"> <li>1 Marketing information obtaining in Meru and other areas</li> </ol>	<ol style="list-style-type: none"> <li>1 Storages to secure food supply to meet population increment</li> </ol>
Public Institutional targets			<ol style="list-style-type: none"> <li>1 Provision of accurate price data (MIB, MOALD)</li> <li>2 Propaganda of auction centre and improvement of cashing system (HCDA)</li> <li>3 Rehabilitation of farm-market roads (MPWH)</li> <li>4 Enroll in the International Union for the Protection of New Varieties of Plants (MOALD)</li> </ol>	<ol style="list-style-type: none"> <li>1 Upgrading of radio programme (MIB, MOALD)</li> <li>2 Provision of price data of export produce (MIB, MOALD)</li> <li>3 Operation of auction centre and acknowledge of existence to EU importers (HCDA)</li> <li>4 Installation of outflower fumigation facilities (HCDA)</li> <li>5 Promotion of production and efficient distribution of high quality seeds (MOALD, KARI)</li> <li>6 Diversification of cooking methods using spices and asian vegetables (MOH)</li> <li>7 Deferring cess to enter markets (Councils)</li> <li>8 Construction of farm-market roads (MPWH)</li> </ol>	<ol style="list-style-type: none"> <li>1 Advertising of campaign for Kenya Produce in EU markets to safety on chemical residue and disease (HCDA &amp; FPEAK)</li> <li>2 Food security adapting on drought and depressing huge price fluctuation (MOALD)</li> <li>3 Improvement of communication infrastructure extending to major irrigation schemes (MOTC)</li> <li>4 Reducing taxes and custom duties on commercial vehicles especially (MOP)</li> <li>5 Pavement of the CS2 road (MPWH)</li> </ol>



Table N.1-3 Dietary Energy Supply per Capita in Africa

Country	Population			Dietary Energy Supply (DES) per Capita & Day			Share in Total Protein DES			Share of Cereals and Root Vegetable in Total DES												Relative Shortage of Dietary Supply in Developing Countries						
	90-92 (million)	79-81 (kcal)	90-92 (kcal)	Annual Growth (%)	Vegetable Foodstuff			Animal Foodstuff			Rice			Wheat			Maize			Sorghum /Millet			Cassava			79-81 (%)	89-92 (%)	90-92 (%)
					Cereals (%)	Bean (%)	Veg /Fruit (%)	Others (%)	Meat (%)	Milk (%)	Fish (%)	Others (%)	89-92 (%)	90-92 (%)	99-02 (%)	89-92 (%)	90-92 (%)	99-02 (%)	89-92 (%)	90-92 (%)	99-02 (%)	89-92 (%)	90-92 (%)	99-02 (%)				
World	5,358.8	2,440	2,580	2,720	0.5	47.2	8.3	4.8	4.2	17.2	9.6	5.9	2.8	20.3	22.0	17.5	19.5	5.4	6.1	4.4	2.6	1.7	1.6	10.5	9.8	7.0	4.7	
Africa	656.9	2,220	2,280	2,290	0.2	53.2	13.2	4.6	7.4	10.8	5.7	3.8	1.0	4.9	6.8	11.5	15.2	14.8	14.6	14.3	10.2	10.3	10.1	10.5	10.5	10.0	10.2	
Algeria	25.6	1,830	2,620	2,900	2.2	63.1	4.6	3.9	2.8	8.9	13.4	1.4	1.8	0.3	0.4	51.4	50.2	0.2	0.2	0.0	0.1	0.0	0.0	17.8	2.9	2.9	1.6	
Angola	9.5	2,110	2,160	1,840	-0.7	35.6	12.2	4.2	12.6	15.3	6.6	13.2	0.3	1.2	6.0	6.5	6.5	19.1	16.1	4.4	2.6	33.5	27.3	11.7	10.1	19.6		
Benin	4.8	2,160	2,190	2,520	0.7	39.3	19.0	3.5	20.6	10.2	1.0	5.0	1.4	1.4	5.2	1.7	3.0	21.0	20.0	6.8	6.8	24.2	21.8	10.3	9.3	4.3		
Botswana	1.3	2,150	2,160	2,320	0.4	42.4	9.5	2.3	3.4	23.2	16.4	1.9	0.8	0.0	2.5	5.2	12.6	22.8	16.8	30.0	12.0	0.0	0.0	9.1	9.6	7.3		
Burkina Faso	9.3	1,730	1,680	2,140	1.0	71.1	13.1	1.5	2.5	7.9	2.4	0.9	0.5	2.7	5.8	1.8	1.4	6.7	12.3	63.7	56.1	0.9	0.1	28.9	32.0	12.4		
Burundi	5.7	2,000	2,040	1,950	-0.4	16.7	57.5	6.9	12.3	3.3	1.3	1.7	0.2	0.3	1.8	1.4	2.0	13.8	12.3	2.0	3.7	9.3	9.5	13.2	15.2	17.6		
Cameroon	11.9	2,320	2,350	2,040	-0.6	42.7	13.9	6.7	12.8	14.1	3.2	6.0	0.5	1.4	4.8	2.9	6.1	20.0	14.3	15.8	13.0	9.4	13.0	7.4	6.7	13.3		
Central Africa	3.1	2,360	2,270	1,720	-1.5	23.9	19.9	5.0	17.2	25.9	3.9	3.7	0.5	1.3	1.9	1.9	3.9	7.0	9.0	7.1	3.8	41.9	26.0	6.9	8.0	25.5		
Chad	5.7	2,170	1,680	1,810	-0.9	46.7	19.1	1.5	5.4	14.0	4.3	8.8	0.3	2.7	4.8	1.5	3.2	1.1	2.4	53.8	35.3	4.7	8.7	12.1	32.9	9.0	9.2	
Congo	2.3	2,060	2,220	2,210	0.3	28.1	12.6	4.8	12.8	18.3	1.3	21.6	0.3	1.8	3.8	7.3	13.5	1.6	4.5	0.0	0.0	49.7	35.1	12.9	9.0	9.0		
Cote d'Ivoire	12.4	2,420	2,820	2,460	0.1	41.5	10.1	6.6	19.5	10.3	2.6	8.9	0.5	16.9	21.3	3.8	5.2	10.7	9.3	2.0	1.4	10.5	12.4	5.6	2.2	5.0		
Egypt	53.6	2,510	3,130	3,340	1.4	67.9	7.8	7.0	2.3	8.0	3.7	2.4	0.8	12.4	9.6	29.9	36.4	19.9	17.3	3.3	1.1	0.0	0.0	5.7	1.5	0.9		
Ethiopia	51.4	1,700	1,810	1,620	-0.3	59.1	21.1	0.9	3.6	10.9	3.6	0.0	0.8	0.0	0.1	10.1	16.1	15.1	18.7	15.3	11.4	0.0	0.0	23.9	19.0	28.0		
Gabon	1.2	2,180	2,400	2,490	0.6	26.8	8.0	8.7	11.9	28.2	2.6	13.3	0.5	2.4	6.9	5.9	9.8	6.4	8.6	0.0	0.0	20.7	11.1	11.8	7.3	5.7		
Gambia	0.9	2,200	2,030	2,320	0.3	62.2	12.1	2.3	2.3	10.9	2.5	7.4	0.4	27.0	38.1	2.7	4.6	2.6	3.8	25.5	18.3	2.2	0.8	10.2	14.5	7.5		
Ghana	15.5	2,200	1,910	2,090	-0.3	35.7	4.6	4.9	23.3	11.1	0.9	19.1	0.5	2.8	5.3	2.6	4.1	13.2	15.0	6.5	5.4	17.0	26.0	9.4	17.8	12.0		
Guinea	5.9	2,170	2,260	2,400	0.5	50.4	12.5	17.7	6.3	5.4	2.0	4.6	1.0	23.3	33.9	1.4	5.0	4.3	3.1	5.3	2.7	14.6	10.5	9.9	8.1	5.8		
Kenya	24.4	2,200	2,150	1,970	-0.5	50.1	8.3	2.7	5.3	13.9	14.7	4.2	0.7	0.7	2.1	3.9	5.8	45.4	40.4	6.4	1.4	5.6	4.4	8.8	9.3	15.1		
Lesotho	1.8	2,000	2,260	2,260	0.6	74.3	6.5	1.8	1.3	13.0	2.1	0.8	0.2	0.0	0.5	23.9	16.4	42.0	56.4	14.7	2.9	0.0	0.0	16.6	9.7	10.0		
Liberia	2.6	2,230	2,400	1,780	-1.1	48.6	11.2	6.4	11.0	10.3	0.6	10.7	1.2	41.6	42.8	2.1	1.7	0.0	0.0	0.0	0.0	25.7	19.8	9.2	6.2	23.0		
Libya	4.7	2,440	3,440	3,290	1.4	49.3	6.4	8.1	3.0	14.7	14.7	1.3	2.5	3.9	4.2	37.5	37.9	0.1	0.2	0.0	0.0	0.0	0.0	4.4	0.3	0.5		
Madagascar	12.4	2,450	2,440	2,160	-0.6	51.9	4.3	3.7	10.4	18.9	6.4	3.7	0.8	51.0	48.9	1.4	1.7	5.0	3.9	0.1	0.0	11.6	16.3	4.2	4.3	8.0		
Malawi	10.0	2,360	2,280	1,910	-1.0	65.4	19.4	3.0	2.7	3.0	0.9	5.2	0.5	0.8	1.4	1.5	0.3	64.7	67.5	2.5	0.7	0.4	1.4	6.4	7.5	16.4		
Mali	9.5	2,050	1,800	2,230	0.4	65.0	7.4	1.5	1.4	13.3	7.6	3.4	0.3	8.4	12.7	0.9	1.8	5.6	8.6	50.4	48.8	0.9	1.0	14.5	23.9	9.5		
Mauritania	2.1	1,940	2,110	2,610	1.4	47.9	9.0	0.7	0.9	17.1	18.9	4.8	0.7	6.5	17.6	4.8	30.0	1.3	0.6	33.8	6.9	0.0	0.0	19.0	13.2	4.4		
Mauritius	1.1	2,320	2,670	2,780	0.9	43.5	9.6	2.4	3.1	15.9	14.7	9.5	1.3	29.1	22.5	23.5	21.7	1.2	0.4	0.0	0.0	0.0	0.0	8.3	4.4	4.0		
Morocco	25.7	2,420	2,720	3,000	1.0	67.6	7.9	4.1	3.1	8.9	3.8	2.6	2.1	0.3	0.4	42.5	44.2	5.4	3.7	0.9	0.3	0.0	0.2	5.3	3.0	1.8		
Mozambique	14.5	1,940	1,920	1,740	-0.5	52.1	14.2	2.2	18.7	7.7	1.9	2.7	0.5	3.3	4.2	3.6	4.1	15.4	17.2	16.9	8.8	4.2	44.2	20.1	20.8	29.2		
Namibia	1.5	2,180	2,210	2,190	0.0	47.1	8.8	1.8	9.7	22.6	5.4	4.3	0.4	0.0	0.0	6.7	6.0	17.2	16.9	12.8	10.9	0.0	0.0	10.0	9.4	9.6		
Niger	8.0	1,990	2,240	2,190	0.5	59.7	21.6	1.7	1.7	9.8	4.8	0.4	0.4	2.7	4.7	0.7	3.4	0.3	0.3	70.8	65.9	5.6	3.0	16.5	9.4	10.4		
Nigeria	112.1	2,380	1,960	2,100	-0.6	47.5	21.5	5.7	13.2	7.0	0.9	2.7	1.5	1.5	8.8	1.6	1.7	6.8	5.2	31.6	22.4	12.7	15.4	6.1	15.6	11.1		
Rwanda	7.3	2,040	2,090	1,860	-0.4	21.5	45.1	8.0	17.9	4.3	2.9	0.1	0.2	0.3	0.7	0.7	1.1	5.2	7.0	12.3	10.3	12.1	8.2	9.5	8.3	14.5		
Senegal	7.5	2,460	2,450	2,310	-0.3	61.1	8.4	1.2	1.3	11.1	6.4	9.8	0.9	18.9	27.2	6.0	8.4	5.3	5.4	27.2	22.6	4.0	0.7	5.6	5.6	7.9		
Sierra Leone	4.3	2,170	2,110	1,820	-0.8	53.4	18.4	5.4	3.9	5.3	1.5	11.1	0.9	43.6	45.2	3.7	3.3	1.5	1.2	1.6	3.8	3.9	3.9	9.3	10.3	19.9		
Somalia	7.7	1,810	1,870	1,590	-0.6	47.3	3.4	1.4	0.3	14.9	31.6	0.9	0.2	3.9	7.6	5.8	8.6	16.2	23.5	16.3	15.4	0.9	0.9	23.2	20.4	35.1		
South Africa	38.9	2,800	2,820	2,810	0.0	56.4	2.6	2.6	2.8	22.6	7.2	3.9	2.0	1.3	3.1	15.0	15.9	34.4	32.4	1.7	2.1	0.0	0.0	10.1	8.5	10.9		
Sudan	25.9	2,190	2,260	2,150	-0.1	57.4	4.8	4.8	2.2	1.3	12.3	21.1	0.4	0.6	0.3	0.7	7.5	18.4	0.5	1.0	46.6	38.4	1.2	0.0	10.1	8.5		
Swaziland	0.8	2,310	2,480	2,680	0.7	58.2	7.0	3.2	1.6	20.9	7.6	0.1	1.4	0.1	3.6	0.2	26.4	33.4	11.7	1.2	0.0	0.0	0.0	6.2	3.9	2.5		
Togo	3.6	2,300	2,240	2,290	0.0	56.4	9.4	3.5	14.6	7.7	1.1	6.7	1.0	2.3	5.0	2.1	6.6	19.6	22.0	13.0	14.0	29.9	19.0	7.9	9.0	7.8		
Tunisia	8.2	2,280	2,810	3,260	1.7	62.0	7.9	6.3	2.8	8.2	7.9	3.3	1.8	0.1	0.3	53.9	52.0	0.0	0.0	0.4	0.1	0.0	0.0	5.2	1.3	0.4		
Uganda	18.1	2,300	2,130	2,220	-0.2	17.1	36.5	10.2	15.2	8.8	3.8	8.0	0.3	0.5	0.9	0.9	0.4	7.4	7.8	15.1	9.5	9.0	17.0	7.4	10.6	8.5		
Tanzania	26.9	1,740	2,280	2,110	0.9	44.7	14.6	5.0	13.1	9.2	3.9	8.6	0.9	3.6	7.0	2.2	1.9	22.7	31.8	4.6	4.9	25.5	21.7	24.1	7.7	11.1		
Zaire (Congo)	38.6	2,160	2,070	2,090	-0.1	24.2	23.7	9.9	22.9	12.3	0.2	6.6	0.2	2.														

Table N.1-4 Postharvest Facilities(1)

District	Division	Facility	Fund	Management	Function	Target Crops
Nyambene	Igembe E.	Grading sheds	Farmers' groups	Small-scale farmers	Grading Binding	Miraa herb
Meru	Timau	Grading shed with cold room made by insulated container	Exporter	Everest	Wighing Grading Sorting Top-tailing Prepacking	Sugar snap Snow pea
	Timau	Packhouse with cold room	Exporter	Siraji & Sirimon farm under management of Homegrown (exporter)	Precooling Labelling Weighing Grading Packing Prepacking	Snow pea Sugar snap Rosecoco bean Carrot Spring onion Spinach Cutflower Rose Carnation Arabicum
	Timau	Packhouse with cold room (grading shed)	Exporter	Lolomarick farm under management of Vitacress (exporter)	Grading Sorting Packing	Spring onion Green pea Lettuce Broad bean Salad leaf
	Timau	Grading house	Exporter	Ol-donyo Farm under management of Vegpro (exporter)	Grading Sorting Packing Weighing	Snow pea Sweet corn
	Timau	Grading house	Exporter	Choice farm under management of Wilham (exporter)	Grading Sorting Packing Weighing	Snow pea Sweet corn
	Nkuene	Grading shed	Donor	Smal-scale Farmers (Mitunguu 1 scheme) for any exporter	Grading Packing Storage	Asian veg. French bean
	Nkuene	Grading shed	Middleman	Operating for any exporter; KHE, East African Growers & Exporters,	Collecting Grading Sorting Packing	French bean Asian veg.
	Abothuguch central	Grading shed	Middleman	Operating for Homegrown (exporter)	Collecting Grading Sorting Packing	French bean Snow pea
	Abothuguch central (Nkubu)	Satellite depot for Auction	OECF	HCDA	Collecting Grading Inspection Precooling (10ton)	Fresh beans Asian Veg.
Tharaka Nithi						
Embu	Manyatta	Collection sheds (16) at Ngeta Location	Farmers' groups	Kiandari horticultural farmers group Operating for Woni Vege-Fru Exporters	Collecting	French bean
	Nebure	Collection sheds (9) at Kirinyaga Location	Farmers' groups	New Karurumo Njoga horticultural farmers group	Collecting	French bean
	Kyeni	Collection sheds (300) at Karurumo Location	Farmers' groups	Karurumo Orchards Operating for Woni Vege-Fru Exporters and others	Collecting Sorting Grading	Mango Avocado
Mberee	Gachoka	Packing house	Large-scale farmer	Kudan sigh	Sorting Grading Packing	French bean Chilli Banana
	Gachoka	Packing house	NGO	Catholic diocese	Sorting Grading Packing Storing	French bean Banana

Table N.1-5 Postharvest Facilities(2)

District	Division	Facility	Fund	Management	Function	Target Crops
Mbereee	Gachoka	Packing house	Large-scale farmer	Dilors farm	Sorting Grading Packing Storing	Pawpaw Brinjar Okra Banana Passion Fruit
	Gachoka	Packing house	Large-scale farmer	Mbereee farm	Sorting Grading Packing Storing	Banana Pawpaw French bean Asian Veg.
	Gachoka	Packing house with cold room	Exporter	Yoder	Precooling Sorting Grading Packing	Cutflower Chrysanthemus Geranium
	Gachoka	Packing house	Exporter	Large-scale farmer	Sorting Grading Packing Storing	French bean
	Siakago	Packing shed	Large-scale farmer	Ruima farm	Sorting Grading Packing Storing	French bean Banana
Kirinyaga	Ndia	Collecting sheds	Small-scale farmers	Contacted farmers operating for Homegrown, EAG, Kibwezi, Sunripe, Wilham, KHE	Collecting	French bean
	Ndia	Buying house	Processing company	Kenya Nut	Buying	Macadamia nut
	Ndia	Buying house	Processing company	Kenya Farm Nut	Buying	Macadamia nut
	Ndia (Sagana)	Satellite depot for Auction	OEFC	HCDA	Collecting Grading Inspection Precooling (20ton)	Fresh beans Okra Avocado
	Mwea (Mwea)	Satellite depot for Auction	OEFC	HCDA	Collecting Grading Inspection Precooling (20ton)	Fresh beans Asian Veg. Chilli Mango
Nyeri	Kieni E.	Grading shed with charcoal cooling	Farmers	Tigitis farm	Sorting Grading Packing	Snow pea French bean
	Kieni E.	Grading house with cold room	Exporter	Everest	Weiging Sorting Grading Prepacking Top-tailing Cooling	Snow pea French bean
	Kieni E.	Grading shed with charcoal cooling	Farmers	Kihang farm	Sorting Grading Packing	Snow pea French bean
	Kieni E.	Grading shed with charcoal cooling	Farmers	Ngunjiri's farm	Sorting Grading Packing	Snow pea French bean
	Kieni E.	Packing shed with charcoal cooling	Farmers	Mrangu's farm	Sorting Grading Packing Storing	Cutflower Rose
	Kieni W.	Grading house with cold room	Farmers	Mweiga Blooms	Sorting Grading Storing Cooling	Cutflower Rose
	Mathira	Buying shed	Middleman	Operating for Sunripes (Exporter)	Collecting Sorting Grading	Snow pea Strawberry Passion Fruit

Table N.1-6 Outlines of Market Facilities

District	Market	Management	Area(m <sup>2</sup> )	Trading Volume (ton/day)	Space			Access Road	Facility Infrastructure							
					for Wholesale	for Retailers	for Loading		Flatness	Floor	Roof	Stool	Security	Hygiene	Drainage	Power Supply
Nyeri	Karatina	Town	16,000	100~200	separated	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Nyeri	Municipality	3,200	50~100	separated	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Mukuruini	Town	2,400	10~20	-	cramped	fair	tarmac	○	△	△	○	○	○	○	○
	Othaya	Town	3,200	10~20	-	fair	fair	tarmac	○	△	△	○	○	○	○	○
	Naromoru	Town	Closed	-	-	-	-	tarmac	○	△	△	○	○	○	○	○
Kirinyaga	Kutus	Town	10,000	50~100	mixed	enough	enough	partly rough	○	△	△	○	○	○	○	○
	Kagio	County	1,000	20~50	mixed	cramped	cramped	tarmac	△	△	△	○	○	○	○	○
	Wanguru	Town	4,900	20~50	-	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Baricho	Town	4,000	10~20	-	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Kerugoya	Town	2,400	10~20	-	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Kaguno	County	800	10~20	-	enough	enough	tarmac	○	△	△	○	○	○	○	○
	Sagana	Town	3,200	5~10	-	enough	fair	partly rough	○	△	△	○	○	○	○	○
Embu	Embu	Municipality	18,000	50~100	separated	fair	fair	tarmac	○	△	△	○	○	○	○	○
	Rumenjes	Municipality	800	10~20	-	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Numbare	County	3,200	5~10	-	enough	enough	rough	○	△	△	○	○	○	○	○
	Manyatta	County	4,000	5~10	-	enough	fair	rough	○	△	△	○	○	○	○	○
Mbeere	Siakago	Town	8,000	20~50	-	fair	cramped	rough	△	△	△	○	○	○	○	○
	Ishara	County	10,000	10~20	-	enough	enough	rough	△	△	△	○	○	○	○	○
	Makutano	County	10,000	5~10	-	enough	enough	tarmac	△	△	△	○	○	○	○	○
Tharaka Nithi	Cluka	Town	600	20~50	-	cramped	cramped	tarmac	△	△	△	○	○	○	○	○
	Chogoria	Town	1,500	10~20	-	cramped	cramped	tarmac	△	△	△	○	○	○	○	○
	Kanwo	County	500	5~10	-	enough	enough	rough	○	△	△	○	○	○	○	○
Meru	Gakoronone	Municipality	18,000	50~100	mixed	fair	fair	partly rough	△	△	△	○	○	○	○	○
	Nkubu	Town	600	20~50	mixed	cramped	cramped	tarmac	○	△	△	○	○	○	○	○
	Mitungu	County	1,200	20~50	-	enough	enough	rough	○	△	△	○	○	○	○	○
	Igoji	County	800	5~10	-	enough	enough	rough	○	△	△	○	○	○	○	○
	Tinani	Town	1,200	5~10	-	enough	enough	tarmac	○	△	△	○	○	○	○	○
Nyanbena	Maau	Municipality	2,400	20~50	-	fair	fair	tarmac	○	△	△	○	○	○	○	○
	Mikinduri	County	800	5~10	-	fair	fair	rough	○	△	△	○	○	○	○	○



Table N.1-7 Export of Fresh Horticultural produce from Kenya

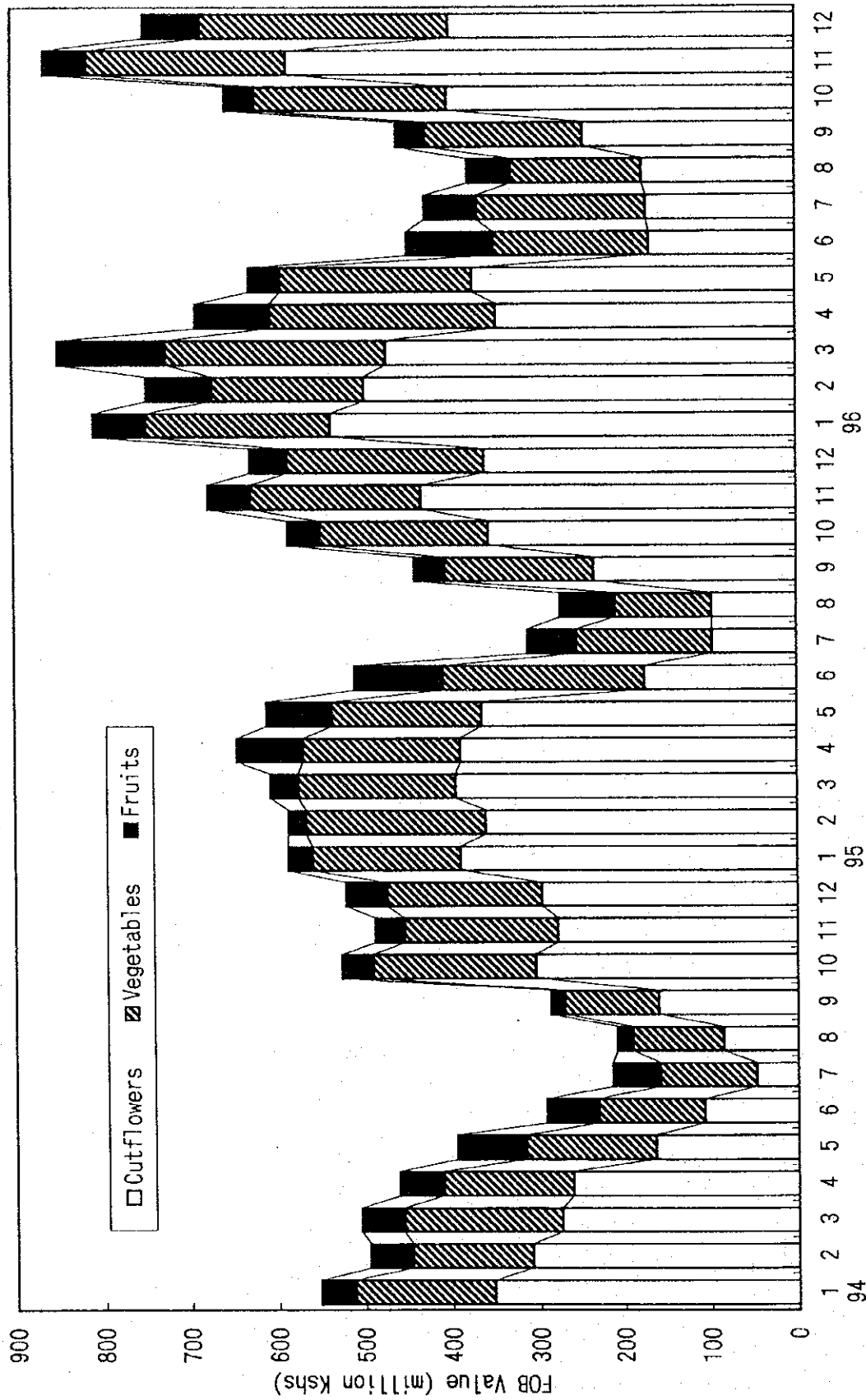
(unit : Kshs)

Produce	1994	1995	1996	Share (%)	Produce	1994	1995	1996	Share (%)
1. Fruits	536,634,122	617,347,495	769,517,015	97	(21) Tuwer		2,816,605	2,274,910	100
(1) Avocado	229,768,131	394,377,200	417,177,920	100	(22) Carrot	4,805,622	2,385,378	2,253,569	100
(2) Mango	133,543,612	104,750,004	195,291,482	100	(23) Guwar	3,872,358	1,660,945	1,879,185	100
(3) Passion fruit	100,453,974	72,080,880	78,561,920	90	(24) Courgette	2,493,610	1,339,005	1,674,624	100
(4) Macadamia nut		1,335	22,294,945	100	(25) Curry leave		1,139,215	1,622,445	100
(5) Pineapple	20,844,880	17,880,310	19,066,775	10	(26) Baby corn		819,957	1,478,557	100
(6) Strawberry	11,591,151	1,665,546	15,069,658	100	(27) Parsely		296,815	1,414,210	100
(7) Banana		13,461,071	10,931,870	100	(28) Asparagus		2,567,205	1,326,367	100
(8) Melon	1,769,394	3,531,609	4,014,968	100	(29) Saragwo		2,219,580	1,214,785	100
(9) Pawpaw	2,626,500	2,219,571	2,087,050	100	(30) Gunda		1,237,005	1,181,235	100
(10) Plum		412,960	778,839	100	(31) Brussels sprout		603,776	1,155,487	100
(11) Grapefruit		682,630	700,163	100	(32) Chora		898,205	1,117,160	100
(12) Lime		744,841	623,471	100	(33) Papri		723,140	866,195	100
(13) Orange		1,268,873	606,446	100	(34) Ginger		72,624	785,781	100
(14) Pear		537,471	541,209	100	(35) Beetroot		632,523	709,241	100
(15) Apple		1,295,484	529,639	100	(36) Capsicum	4,621,820	2,389,200	633,325	100
(16) Custard apple		874,425	304,291	100	(37) Lettuce		834,642	541,743	100
(17) Guava		14,062	294,145	100	(38) Cucumber		1,717,344	535,157	100
(18) Coconut		978,377	177,733	100	(39) Leek	464,778	513,530	442,775	100
(19) Lemon	1,231,500	305,092	150,143	100	(40) Celery		408,866	260,503	100
(20) Pearch		28,836	109,203	100	(41) Basil		135,547	249,022	100
(21) Sour sop		112,051	104,041	100	(42) Mushroom		1,839,808	238,342	100
(22) Horned melon		49,751	58,117	100	(43) Limdi		655,380	219,835	100
(23) Currant		15,664	15,664	100	(44) Cauliflower		448,738	213,066	100
(24) Tamarillo		52,688	14,685	100	(45) Groundnut		491,013	165,184	100
(25) Tangerine		4,806	8,900	100	(46) Gisoda		119,295	162,415	100
(26) Gooseberry		178	1,958	100	(47) Raddish		144,002	161,713	100
(27) Lynchee		1,780	1,780	100	(48) Broccoli		269,136	156,907	100
(28) Misc. Fruits	34,804,980			100	(49) Turnip		285,423	142,578	100
2. Vegetables	1,768,022,157	2,204,836,702	2,566,079,716	90	(50) Sweet potato		4,070,860	129,495	100
(1) French bean	971,145,100				(51) Cassava		159,221	47,437	100
-Fresh		722,222,680	890,854,672	90	(52) Coriander		249,289	39,783	100
-Frozen		34,000,804	37,398,612	50	(53) Garlic		22,695	33,820	100
-Top tail		6,681,920	7,882,872	50	(54) Pumpkin		108,669	29,726	100
-Extra fine		286,479,112	231,967,732	90	(55) Chive		23,407	11,748	100
-Prepacked		72,654,706	71,098,674	50	(56) Fennel		20,292	8,722	100
(2) Snow pea	182,630,580	209,506,017	303,012,928	80	(57) Dill		5,963	6,631	100
(3) Runner bean	36,479,875	196,410,204	235,383,840	90	(58) Arrow root		5,874	5,874	100
(4) Okra	91,767,130	155,641,330	167,930,506	100	(59) Methi		10,065	5,500	100
(5) Chillli	123,137,772				(60) Mooli	22,176	28,875	3,355	100
-fresno		623,755	5,532,835	100	(61) Chive		0	3,115	100
-tobbas		44,751,465	60,393,823	100	(62) Chevda		0	2,136	100
-long		8,852,800	10,873,995	100	(63) Helda		330	330	100
-short		25,959,285	19,681,750	100	(64) Fundina		0	0	100
-thin		4,341,040	6,807,185	100	(65) Palak		0	0	100
(6) Snap pea		56,112,267	91,326,119	90	(66) Other Asian Veg.	28,906,592	13,629,994	63,568,517	100
(7) Karella	71,305,670	76,125,170	73,546,330	100	(67) Misc Veg.	45,066,515			
(8) Bobby bean	53,400,500	52,159,864	52,191,784	90	(68) Misc Root Veg.	39,211,384			
(9) Aubergine	51,170,420	43,242,210	49,280,165	100	3. Cutflowers	2,637,718,755	3,642,318,837	4,366,318,566	33
(10) Ravaya		33,584,815	41,113,050	100	(1) Rose		1,766,032,800	2,117,074,904	0
(11) Onion		30,261,691	31,183,731	100	(2) Carnation		560,668,852	672,115,465	0
(12) Valore	20,680,256	17,560,785	23,469,410	100	-std		282,368,584	338,496,229	0
(13) Dudhi	20,013,210	23,188,990	22,173,195	100	-spray		272,468,424	326,628,171	0
(14) Cabbage		15,749,084	16,349,656	100	-mini		5,831,844	6,991,065	0
(15) Spinach		9,790,089	11,113,252	100	(3) Statice		493,693,476	591,827,099	100
(16) Patra		6,682,610	5,585,965	100	(4) Alstroemeria		331,021,844	396,820,511	100
(17) Tomato	16,826,789	11,455,813	3,004,818	100	(5) Others		380,648,628	456,311,829	100
(18) Tindori		4,595,965	2,909,665	100					
(19) Sugarcane		1,795,130	2,679,167	100	Total	4,942,375,034	6,464,503,034	7,701,915,297	58
(20) Turia		6,407,665	2,361,480	100					

N.B. : The 'Share' is of estimated production by medium and small-scale farmers.

Source : HCDA and the Study Team

Figure N.1.1-5 Seasonal Fluctuation of Export of Horticultural Produce in Value (1994-1996)



Source : HCDA

Figure N.1-6 Export of French Bean (1994-1996)

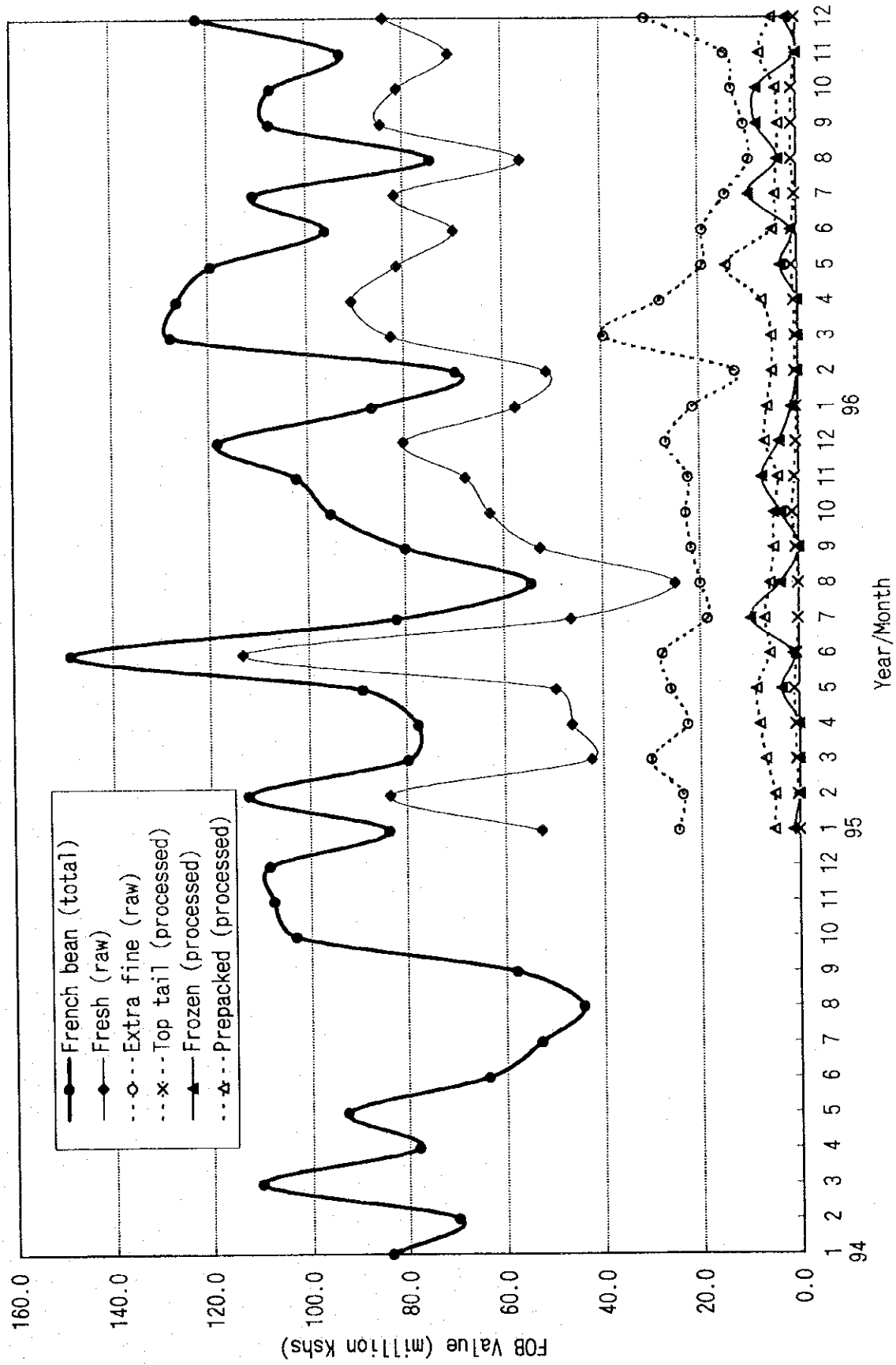


Figure N.1-7 Export of Major Beans and Peas(1994-1996)

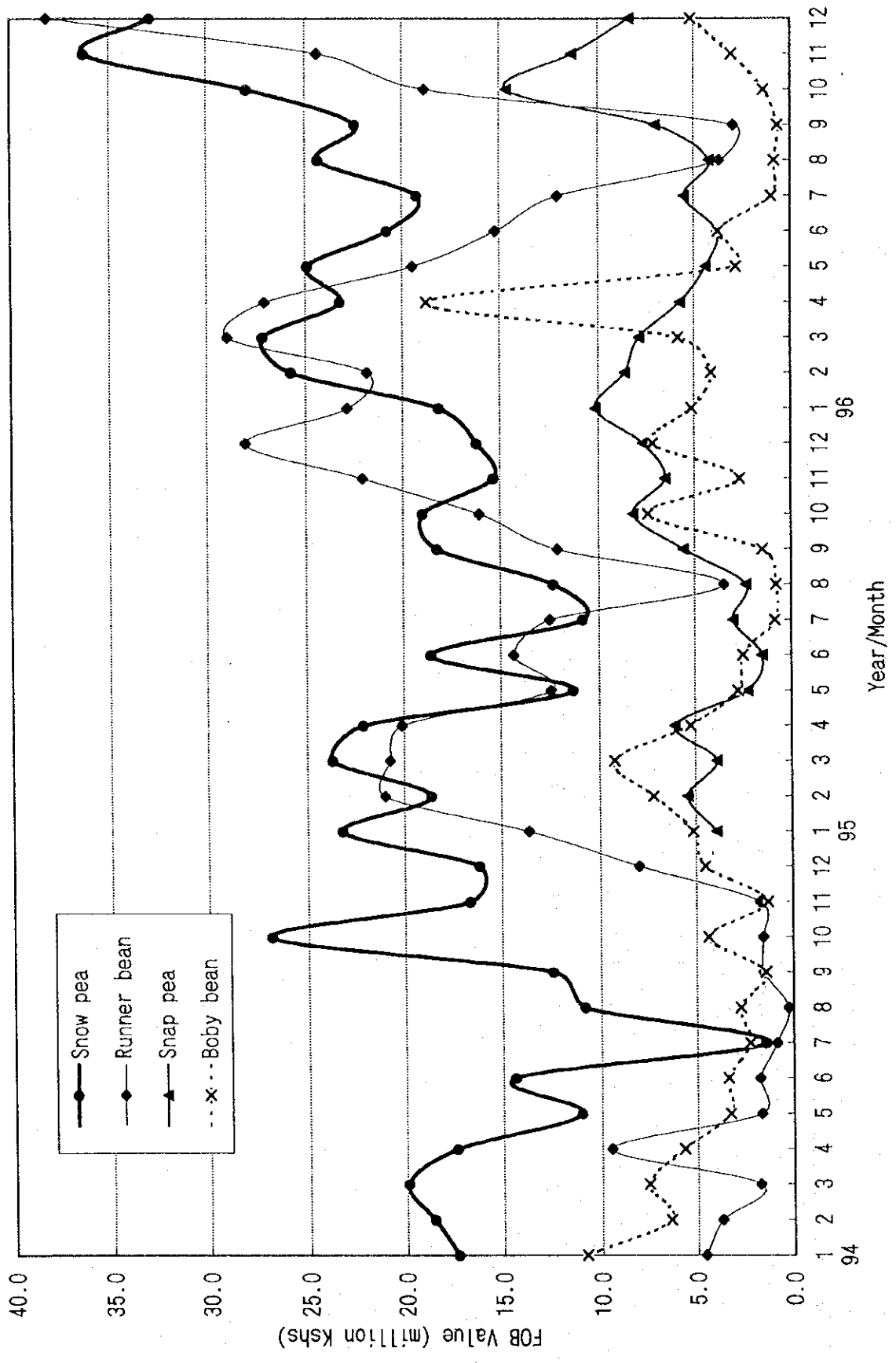


Figure N.1-8 Export of Major Vegetables(1994-1996)

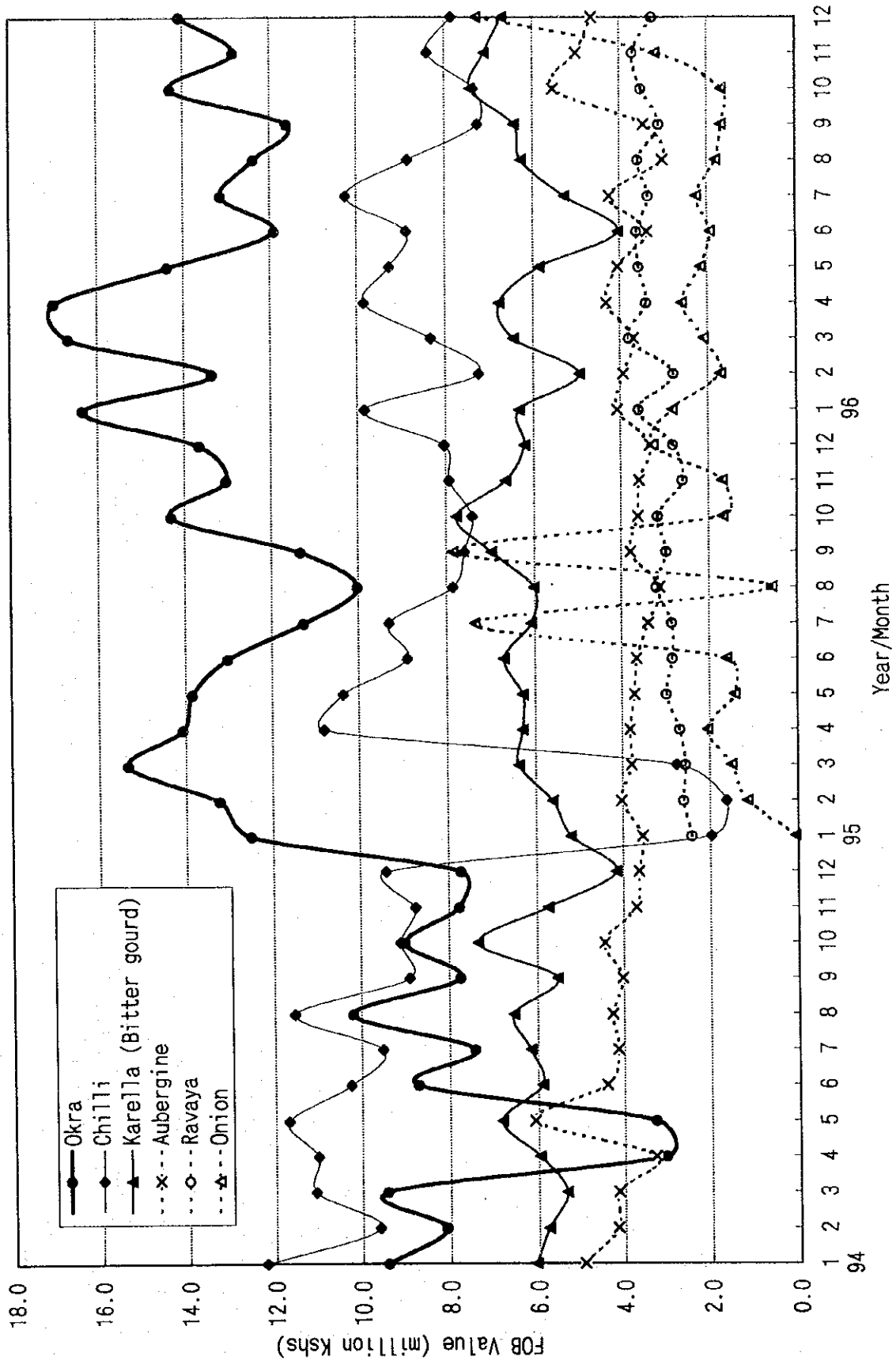


Figure N.1-9 Export of Minor Vegetables(1994-1996)

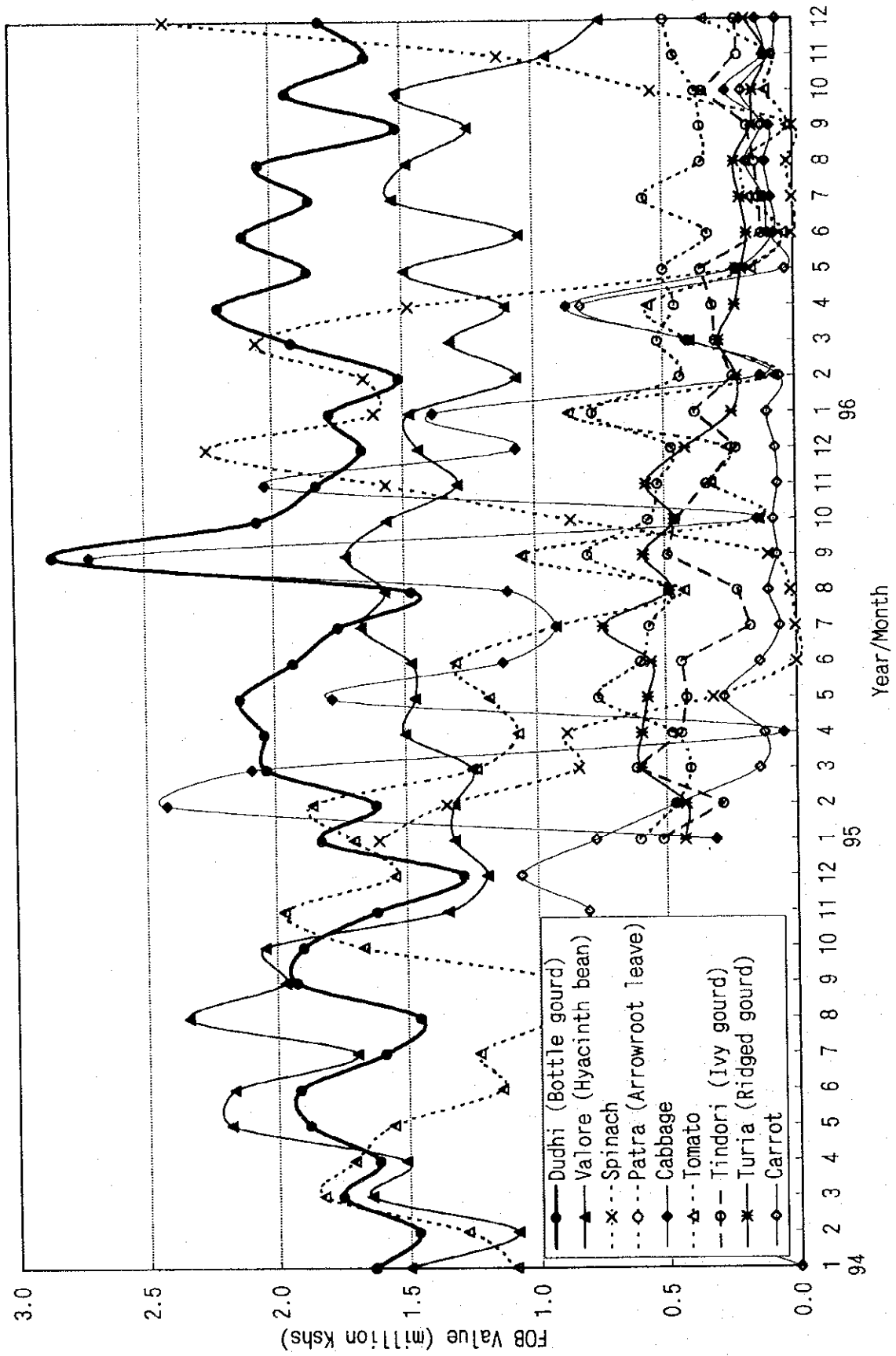


Figure N.11-10 Export of Major Fruits(1994-1996)

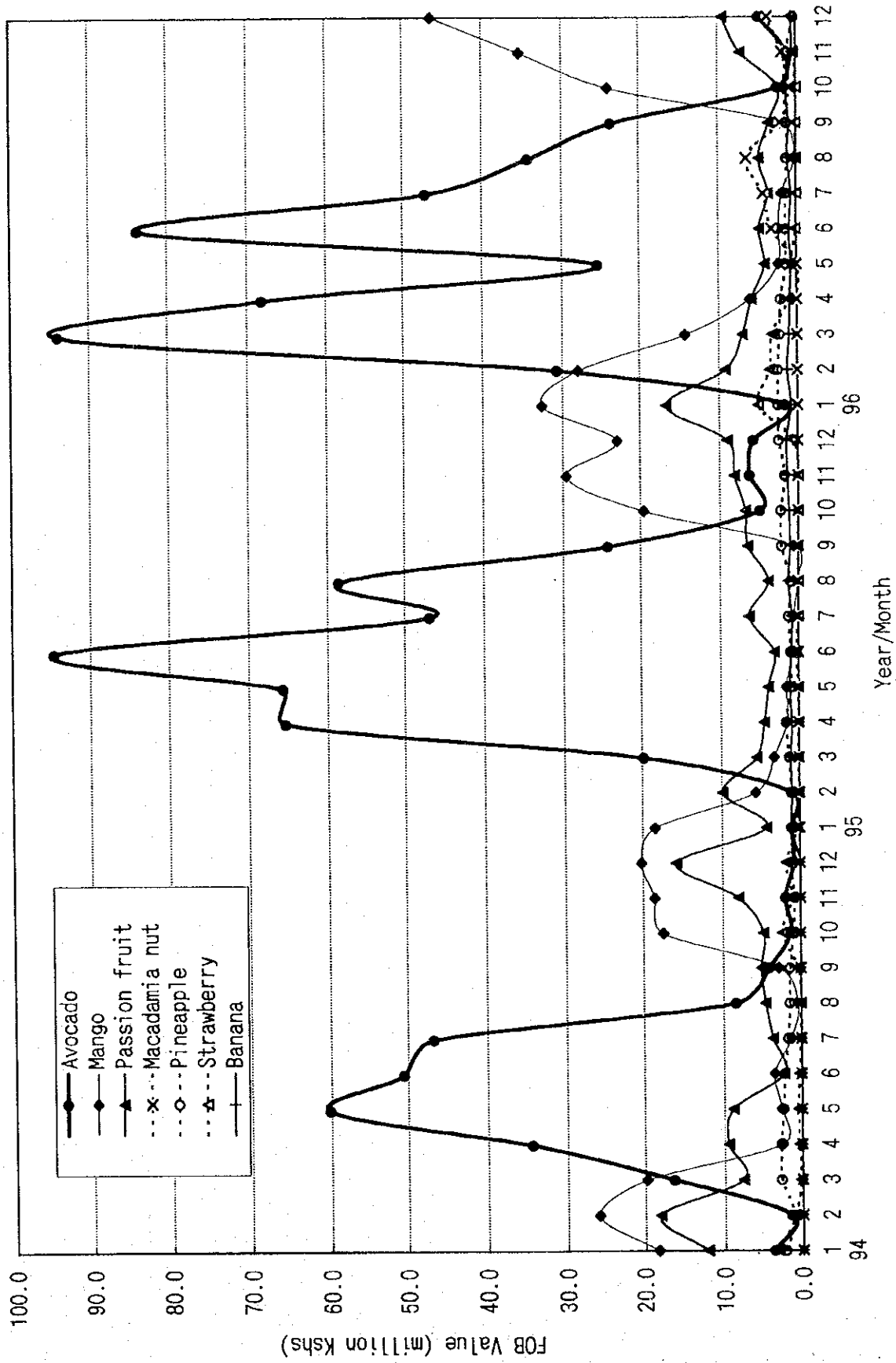


Table N.1-8 EU Imports of Fresh Fruits and Vegetables from African-Caribbean-Pacific Countries (1996)  
(Unit : ton)

Country	Fruits								Vegetables		Total
	Banana	Pineapple	Avocado	Mango	Citrus	Melon	Pawpaw	Others	Beans	Others	
1 Cote d'Ivoire	180,827	153,692	5	6,466	3		221	14,678	13	619	356,524
2 Cameroon	166,179	3,156		43			25	13	1,092	415	170,923
3 Ste Lucia	106,669		35	213				346		475	107,738
4 Jamaica	89,610		34	482	5,926		1,359	48		3,797	101,256
5 Dominica, Republic	61,371	9,528	407	216	65	847	1	14,313	674	876	88,298
6 Belize	54,108			389	249		216				54,962
7 St Vincent	44,175		8	22				31		177	44,413
8 Dominica	39,307		1	18	17			88		98	39,529
9 Kenya	37	54	7,687	310	1	26	11	701	17,053	9,345	35,225
10 Ghana	2,995	22,199	3	11		2	780	180	14	8,678	34,862
11 Surinam	27,161			16	1	2		33	36	640	27,889
12 Swaziland		20	107		25,846					27	26,000
13 Somalia	25,121			2							25,123
14 Zimbabwe		26		354	16,763			822	1,898	185	20,048
15 Madagascar		4						11,216	357	32	11,609
16 Senegal		7	31	86		314	5	11	4,511	126	5,091
17 Ethiopia		1	4			12		1	2,820	25	2,863
18 Mozambique					2,782						2,782
19 Burkina Faso		21		293					2,062	7	2,383
20 Grenada	2,007		4	141				49		87	2,288
21 Gambia				718		2		14	817	540	2,091
22 Barbados	1,822		1	14				65		118	2,020
23 Mali		23	7	1,323				46	392	180	1,971
24 Nigeria		6		31	21	14		30	6	1,269	1,377
25 Uganda	23	9	6	2				17	18	1,050	1,125
26 Benin		861		15						7	883
27 Guinea	6	395		195		103			7		706
28 Zambia				9	37				495	158	699
29 Togo	49	164	22	12				2		255	504
30 Sudan				20		266		46	49	15	396
31 Burundi	54			15			35	116	1	149	370
32 Tanzania						4			290	47	341
33 Mauritius		215	1					57		32	305
34 Zaire	1							1		295	297
35 Trinidad & Tobago				6			3	3		166	178
36 Guyana	2							45		67	114
37 Namibia			2		3	51	1				57
38 Bahamas			18		28						46
39 Liberia	45										45
40 Congo										27	27
41 Antigua & Barbuda								24		1	25
42 Sierra Leone		3		1				8		10	22
43 Haiti					13			4		4	21
44 Angola	18							2			20
45 Fiji										19	19
46 Niger									15		15
47 Rwanda		8								6	14
48 Mauritania								1	10	1	12
49 Tchad						7					7
50 Guinea Bissau						7					7
51 Malawi										7	7
52 Gabon										3	3
Total	801,595	190,384	8,383	11,423	51,755	1,657	2,657	43,011	32,630	30,035	1,173,530

Source : Comite de Liaison Europe Afrique-Caraibes-Pacifique

N.B. The imports of 'Extra-EU' do not include imports from Canary Islands.

In the Table, South Africa, Egypt and Morocco are excluded due to county's category.



Table N.1-9 Main Supplying Country of EU Markets(1):Green Beans

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996				Trend															
	13,580 9,736 1,887 2,569 1,368 3,409 542 528 739 11 662 27 391 130 60 542 614 251 143 352 81 390	14,414 6,616 2,780 3,850 1,366 3,323 353 185 1,054 129 234 238 397 143 60 542 348	12,483 7,456 3,728 3,018 1,484 2,820 700 374 1,138 169 145 408 257 141 249 835 208	12,665 11,042 3,155 5,364 2,182 2,956 667 551 1,680 268 204 568 298 193 280 603 71	14,800 13,367 2,371 4,940 2,929 3,328 1,222 906 709 813 219 625 443 489 331 335 63	Share					17,053 16,857 4,511 4,463 2,820 2,062 1,898 1,092 1,056 817 703 674 563 495 392 357 290 124 108 89 80 51 49 46 36 21 18 15														
						30.0%	29.6%	7.9%	5.0%			3.6%	3.3%	1.9%	1.9%	1.4%	1.2%	1.2%	1.0%	0.9%	0.7%	0.6%	0.5%	0.2%	0.2%
1 Kenya						56.5%	FRA	26.0%	BEL	7.1%	growing (Jun,Dec)														
2 Egypt						71.1%	UK	8.5%	GER	6.2%	growing (May,Nov-Jan)														
3 Senegal						51.2%	FRA	32.3%	BEL	8.3%	growing (May)														
4 Morocco						94.7%	SPA	2.7%	HOL	1.9%	growing														
5 Ethiopia						48.7%	HOL	25.2%	GER	12.8%	growing														
6 Burkina Faso						98.9%					depressing														
7 Zimbabwe						96.5%					highly growing														
8 Cameroon						95.1%					growing														
9 Canary Islands						73.3%	UK	24.3%			stable														
10 Gambia						71.4%	HOL	28.0%			highly growing														
11 Jordan						35.0%	GER	23.6%	UK	21.9%	growing														
12 Dominican Rep						97.9%					growing														
13 Turkey						59.0%	AUS	17.2%	ITA	6.6%	growing														
14 Zambia						99.2%					newly exporting														
15 Mali						98.2%					growing														
16 Madagascar						100.0%					growing														
17 Tanzania						95.2%	HOL	4.8%			depressing														
18 Poland						79.0%	ITA	19.4%			depressing														
19 Albania						100.0%					newly exporting														
20 Guatemala						98.9%					newly exporting														
21 Oman						0.1%					newly exporting														
22 Thailand						0.1%					depressing														
23 Sudan						0.1%					newly exporting														
24 South Africa						0.1%					newly exporting														
25 Surinam						0.1%					depressing														
26 Peru						0.0%					newly exporting														
27 Uganda						0.0%					newly exporting														
28 Niger						0.0%					depressing														
Total of imports from Extra-EU	37,895	37,555	37,278	44,077	48,930	Main Importer in 1996				Market Growth (96/91)															
						1	Holland	18,116	32%	48%	Whole EU Markets growing at 50%														
						2	France	15,046	26%	3%															
						3	UK	14,663	26%	146%															

Source : Comité de Liaison Europe-Afrique-Caraibes-Pacifique

Table N.1-10 Main Supplying Country of EU Markets(2):Asparagus

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996						Trend
						Share	Destination			Share	Trend	
							Share	Volume (ton)	Share			
1 Peru	460	832	997	1,328	1,740	2,197	22.8%	32.8%	28.9%	HOL	22.1%	highly growing
2 USA	1,716	1,561	1,344	1,254	1,174	1,451	15.0%	50.3%	15.9%	FRA	15.2%	stable
3 South Africa	272	238	595	954	827	1,168	12.1%	61.8%	30.8%	UK	4.3%	highly growing
4 Hungary	65	132	114	211	744	1,060	11.0%	74.6%	AUS	SWE	3.5%	highly growing
5 Poland	709	934	927	1,082	1,250	1,055	10.9%	91.6%	HOL	BEL	1.0%	growing
6 Morocco	384	321	566	541	308	711	7.4%	48.4%	FRA	ITA	3.1%	growing
7 Chile	753	759	488	487	520	534	5.5%	31.8%	SPA	UK	15.9%	depressing
8 Argentina	449	631	153	185	233	332	3.4%	37.7%	UK	GER	16.9%	depressing
9 Slovakia	121	150	146	175	235	314	3.3%	84.7%	GER	FRA	1.0%	newly exporting
10 Thailand	227	243	238	124	127	150	2.2%	51.9%	HOL	GER	12.9%	growing
11 Mexico	113	77	35	54	99	119	1.6%	51.3%	FRA	BEL	10.7%	depressing
12 Ecuador					98	67	1.2%	74.8%	HOL	GER	5.0%	growing
13 New Zealand					45	66	0.7%	100.0%				newly exporting
14 Zimbabwe					6	34	0.4%	100.0%				growing
15 Turkey						29	0.3%	100.0%				newly exporting
16 Philippines						28	0.3%	100.0%	SPA			newly exporting
17 China					43	24	0.2%	100.0%	HOL			newly exporting
18 Hongkong	82	56	79	105	16	20	0.2%	70.0%	FRA			depressing
19 Tunisia	39	69	58	30	33	15	0.2%	73.3%	UK			depressing
20 Guatemala					17	9	0.1%					newly exporting
21 Kenya					0	0	0.0%					depressing
22 Ethiopia							0.0%					depressing
23 Australia												depressing
Total of imports from Extra-EU	5,546	6,155	5,926	6,761	7,857	9,643	Main Importer in 1996			Share	Market Growth (96/91)	
							1 Germany	3,027	31%	61%	Whole EU Markets	
							2 UK	2,062	21%	39%	growing at	
							3 Spain	1,247	13%	206%	74%	

Source : Comité de Liaison Europe-Afrique-Caraïbes-Pacifique

Table N.1-11 Main Supplying Country of EU Markets(3):Banana

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996						Trend	
						Share	Destination			Trend			
							GER	BEL	ITA				
1 Ecuador	600,766	767,306	605,110	550,621	633,535	686,474	17.6%	31.6%	BEL	30.1%	ITA	20.0%	stable
2 Colombia	512,347	592,773	417,907	475,058	565,721	657,199	16.8%	BEL	ITA	13.9%	SPA	9.2%	growing
3 Costa Rica	569,373	577,179	480,328	62,215	567,343	606,600	15.5%	BEL	GER	17.9%	SPA	16.4%	slightly growing
4 Canary Islands	339,450	346,626	324,678	264,517	332,065	319,387	8.2%	SPA	BEL	19.5%	SWE	14.3%	stable
5 Panama	484,574	540,116	413,125	301,894	415,635	310,646	8.0%	GER	BEL	35.6%	BEL	1.5%	depressing
6 Martinique	181,069	19,805	176,757	131,633	184,306	246,218	6.3%	FRA	BEL	12.9%	BEL	1.5%	growing
7 Cote d'Ivoire	116,425	146,246	161,257	149,347	160,485	180,827	4.6%	FRA	UK	15.0%	BEL	12.6%	growing
8 Cameroon	115,841	110,743	146,901	158,229	138,323	166,179	4.3%	FRA	UK	8.6%	UK	5.9%	depressing
9 Honduras	138,396	207,872	193,529	26,891	56,054	114,267	2.9%	BEL	IRE		UK		depressing
10 St Lucia	102,651	123,898	113,303	91,542	101,495	106,669	2.7%	UK	100.0%				stable
11 Jamaica	70,116	74,825	7,739	76,417	83,824	89,610	2.3%	UK	100.0%				growing
12 Guatemala	13,186	6,383	29,946	19,907	57,520	61,793	1.6%	BEL	GER	27.6%	UK	23.9%	highly growing
13 Dominican Rep.	10,298	38,489	61,662	86,054	75,121	61,371	1.6%	BEL	IRE	16.7%	ITA	12.5%	growing
14 Belize	19,616	28,493	38,516	4,698	42,033	54,108	1.4%	UK	BEL	3.7%			growing
15 St Vincent	63,063	73,355	57,608	32,054	47,673	44,175	1.1%	UK	100.0%				depressing
16 Dominica	54,961	55,933	52,699	43,117	33,437	39,307	1.0%	UK	100.0%				depressing
17 Surinam	27,744	29,949	27,984	32,739	28,988	27,161	0.7%	UK	100.0%				stable
18 Somalia	8,177	181	501	4,634	21,734	17,805	0.5%	ITA	100.0%		BEL	15.5%	highly growing
19 Venezuela							0.3%	GER	ITA				newly exporting
20 Nicaragua	65,218	28,423	962	8	0	12,610	0.3%						erratic
21 Guadeloupe	116,124	115,163	98,144	60,241	61,322	5,545	0.1%						depressing
22 Ghana	552	100	218	492	1,646	2,995	0.1%						highly growing
23 Grenada	8,186	6,014	672	5,325	4,558	2,007	0.1%						depressing
24 Barbados						1,822	0.0%						newly exporting
25 Mexico	39	17,464	112	58	50	1,570	0.0%						erratic
26 USA	1,965	779	1,915	897	831	618	0.0%						depressing
27 Taiwan						601	0.0%						newly exporting
28 Iceland						446	0.0%						newly exporting
29 Israel						406	0.0%						newly exporting
30 Philippines	165	128	1,858		120	288	0.0%						erratic
31 Togo	120	122	114	77	58	49	0.0%						depressing
32 Kenya	1,418	122	1,989	51	35	37	0.0%						depressing
Total of imports from Extra-EU	3,629,132	4,150,677	3,569,944	3,304,840	3,742,218	3,903,213		Main Importer in 1996	Volume (ton)	Share	Market Growth (96/91)		
								1 Belgium/Lux.	1,107,466	28%	443%	Whole EU Markets	stable at
								2 Germany	589,156	15%	-56%		8%
								3 Spain	525,345	13%	55%		

Source : Comité de Liaison Europe-Caraïbes-Pacifique

Table N.1-12 Main Supplying Country of EU Markets(4):Pineapple

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996				Trend																						
	Share						Destination																									
	153,692	64,314	22,199	10,308	9,528	3,156	2,466	1,063	861		536	395	344	215	168	164	134	128	76	74	54	45	26	23	22	16	9	6	6	3	Main Importer in 1996	Volume (ton)
1 Cote d'Ivoire	134,795	132,062	11,915	120,311	119,565	56.0%	FRA	82.8%	BEL	7.9%	ITA	3.7%	growing(peak:Mar,Dec)																			
2 Costa Rica	34,149	38,271	39,409	45,832	49,735	23.4%	BEL	40.4%	UK	22.4%	ITA	18.9%	growing																			
3 Ghana	6,766	7,126	10,917	13,746	11,917	8.1%	BEL	64.5%	HOL	13.8%	GER	11.8%	highly growing																			
4 Honduras	18,748	13,920	3,231	325	28	3.8%	BEL	98.9%	HOL	29.1%	ITA	6.3%	depressing																			
5 Dominican Rep.	14,463	28,891	12,303	3,934	3,082	3.5%	BEL	64.6%	HOL	24.9%	ITA	4.4%	depressing																			
6 Cameroon	405	538	186	1,095	1,814	1.1%	FRA	74.9%	BEL	27.2%	ITA		highly growing																			
7 South Africa	1,886	1,566	1,197	1,678	2,056	0.9%	HOL	56.7%	GER				growing																			
8 Reunion Islands	305	416	492	851	1,048	0.4%	FRA	98.6%	BEL	17.7%			highly growing																			
9 Benin	39	240	575	1,063	1,079	0.3%	FRA	82.3%	BEL	13.1%	GER		highly growing																			
10 Thailand	606	376	412	580	649	0.2%	AUS	34.9%	SWE	4.3%			slightly growing																			
11 Guinea	396	686	619	659	558	0.1%	FRA	95.4%	HOL	47.1%	HOL	5.5%	depressing																			
12 Turkey	51	196	205	94	242	0.1%	GER	47.4%	IRE	4.2%	ITA	2.3%	newly exporting																			
13 Mauritius						0.1%	FRA	92.1%	GER				growing																			
14 Morocco						0.1%	FRA	100.0%					newly exporting																			
15 Togo	273	152	42	39	15	0.1%	FRA	100.0%	BEL	35.8%	ITA	19.4%	erratic																			
16 Ecuador	29	520	6,011	9,635	1,675	0.0%	HOL	44.8%	BEL				newly exporting																			
17 Brazil	104	25	464	46	298	0.0%	HOL	100.0%	GER	17.1%	ITA	3.9%	depressing																			
18 Colombia						0.0%	HOL	78.9%	GER	4.1%			depressing																			
19 Guatemala						0.0%	BEL	95.9%	GER	33.3%	GER	14.8%	newly exporting																			
20 Kenya	174	156	127	66	93	0.0%	HOL	51.9%	FRA				depressing																			
21 Chile						0.0%							newly exporting																			
22 Zimbabwe						0.0%							newly exporting																			
23 Mali	60	2,263	20	38	1	0.0%							newly exporting																			
24 Mexico	5	2	3		1	0.0%							newly exporting																			
25 Philippines	93	9	2	4	5	0.0%							newly exporting																			
26 Uganda	55	76	28	55	31	0.0%							depressing																			
27 USA	189	17	17	31	14	0.0%							depressing																			
28 Nigeria	104	12	2			0.0%							depressing																			
29 Martinique						0.0%							erratic																			
Total of imports from Extra-EU	215,244	228,648	211,987	226,172	230,587		1 France		132,804	48%			Market Growth (96/91)																			
							2 Belgium/Lux.		74,371	27%			Whole EU Markets																			
							3 Italy		19,486	7%			growing at 28%																			

Source : Comite de Liaison Europe Afrique-Caraibes-Pacifique

Table N.1-13 Main Supplying Country of EU Markets(5):Mango

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996				Trend				
							Share	Destination						
	13,095	13,687	13,095	19.0%	HOL	76.3%		UK	16.0%		POR	3.2%		
1 Brazil	5,735	7,635	9,991	9,177	13,687	13,095	19.0%	HOL	76.3%	UK	16.0%	POR	3.2%	growing(Nov-Dec)
2 USA(Puerto Rico)	5,818	5,190	5,071	4,870	5,998	6,490	9.4%	HOL	89.2%	BEL	6.2%	UK	3.7%	slightly growing
3 Cote d'Ivoire	1,359	2,566	2,508	4,999	8,284	6,466	9.4%	FRA	91.9%	HOL	4.6%	SPA	1.7%	highly growing(Apr-May)
4 Mexico	2,933	3,086	2,900	3,409	4,984	6,359	9.2%	HOL	58.6%	FRA	20.3%	UK	12.6%	growing
5 South Africa	2,075	4,119	3,647	5,255	6,203	5,483	8.0%	HOL	39.0%	BEL	34.1%	UK	9.9%	growing
6 Peru	1,598	1,590	2,134	894	2,912	4,860	7.1%	BEL	45.5%	FRA	23.3%	HOL	22.4%	highly growing
7 Israel	2,591	2,507	2,976	3,329	3,656	4,657	6.8%	FRA	95.7%	GRE	1.5%	HOL	1.4%	growing
8 Venezuela	3,190	3,208	2,987	3,016	4,132	4,081	5.9%	UK	36.3%	POR	34.1%	HOL	15.6%	growing
9 Ecuador	1,828	2,228	2,500	3,277	2,843	3,541	5.1%	BEL	39.3%	HOL	33.5%	SPA	16.2%	newly exporting
10 Pakistan	1,914	1,162	924	1,803	1,904	2,673	4.1%	UK	81.0%	GER	8.3%	FRA	4.3%	growing
11 Costa Rica	2,144	1,170	1,008	837	756	1,323	3.9%	HOL	33.1%	BEL	26.6%	GER	25.4%	growing
12 Mali	958	1,102	1,157	1,266	1,203	1,060	1.5%	UK	80.9%	HOL	16.8%	POR	1.2%	slightly depressing
13 India	467	463	484	611	428	718	1.0%	UK	87.5%	GER	4.2%	FIN	3.6%	stable
14 Gambia	826	943	770	639	423	626	0.9%	HOL	94.2%	HOL	5.8%	HOL	2.6%	growing
15 Guatemala	1,261	966	811	690	690	516	0.7%	BEL	60.5%	UK	34.3%	HOL	2.6%	depressing
16 Honduras						482	0.7%	UK	93.8%	HOL	6.2%			newly exporting
17 Jamaica	397	448	172	227	156	310	0.5%	GER	100.0%					depressing
18 Belize	951	1,232	896	734	491	293	0.4%		100.0%					newly exporting
19 Zimbabwe	105	167	142	285	351	278	0.4%		36.7%	FRA	22.6%	GER	21.2%	newly exporting
20 Kenya	452	485	310	493	299	354	0.5%	HOL	59.0%	HOL	14.8%	UK	11.3%	slightly depressing
21 Burkina Faso	374	397	647	457	220	310	0.5%	GER						depressing
22 Thailand	173	129	202	132	123	141	0.2%							growing
23 St Lucia	221	306	288	332	114	90	0.1%							depressing
24 Guinea	34	7	25	28	82	86	0.1%							slightly depressing
25 Grenada	19	76	89	50	64	11	0.0%							depressing
26 Colombia														highly growing
27 Senegal														depressing
28 Ghana														
Total of imports from Extra-EU	39,498	42,451	43,905	49,135	63,674	68,874	Main Importer in 1996			Volume (ton)	Share	Market Growth (96/91)		
							1	Holland	27,462	40%	209%	Whole EU Markets		
							2	France	15,931	23%	72%	growing at		
							3	UK	11,777	17%	-10%	74%		

Source : Comité de Liaison Europe-Afrique-Caraibes-Pacifique

Table N.1-14 Main Supplying Country of EU Markets(6):Pawpaw

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996				Trend				
	Share	Destination	Share	Destination	Share	Destination	Share	Destination						
1 Brazil	3,278	3,960	4,389	5,114	5,047	4,894	55.7%	HOL	35.3%	GER	17.1%	UK	16.5%	growing(peak:Dec-Jan)
2 Jamaica	729	936	1,105	1,251	1,464	1,359	15.5%	UK	83.0%	HOL	11.8%	FRA	3.5%	growing
3 Ghana	14	10	13	23	363	780	8.9%	GER	44.9%	UK	23.7%	BEL	20.1%	highly growing
4 Costa Rica	1,757	1,726	1,103	610	154	308	3.5%	HOL	88.6%	BEL	7.8%	GER	1.6%	depressing
5 USA	61	286	402	334	347	258	2.9%	GER	73.3%	FRA	8.5%	UK	8.5%	slightly growing
6 South Africa	9	2	68	22	101	252	2.9%	HOL	35.7%	GER	20.6%	FRA	18.3%	highly growing
7 Cote d'Ivoire	299	208	345	330	196	221	2.5%	FRA	73.3%	HOL	24.0%	GER	2.7%	slightly depressing
8 Belize	87	100	120	115	123	143	1.6%	GER	43.4%	FRA	27.3%	AUS	11.9%	newly exporting
9 Thailand	215	253	122	139	152	84	1.0%	HOL	100.0%	UK	7.1%	HOL	2.4%	depressing
10 Malaysia	3	25	26	28	52	42	0.5%	FRA	90.5%	UK	45.7%	HOL	2.4%	highly growing
11 Mexico		12	47	52	69	35	0.4%	FRA	54.3%	HOL				depressing
12 Brundi						25	0.3%	FRA	100.0%	SPA	17.4%			newly exporting
13 Cameroon						23	0.3%	UK	82.6%	SPA				newly exporting
14 Cuba						19	0.2%	BEL	57.9%	FRA	31.6%	UK	10.5%	newly exporting
15 Colombia						17	0.2%	BEL	100.0%					newly exporting
16 Switzerland					46	14	0.2%	SPA	100.0%					newly exporting
17 Canary Islands					19	13	0.1%	GER	100.0%					newly exporting
18 Turkey					6	12	0.1%	ITA	100.0%					newly exporting
19 Argentina						11	0.1%	GER	54.5%	SWE	36.4%	IRE	9.1%	newly exporting
20 Kenya						10	0.1%							newly exporting
21 Venezuela						10	0.1%							newly exporting
22 Chile						10	0.1%							newly exporting
23 Vietnam	17	19	18	27	14	6	0.1%							depressing
24 Trinidad & Tobago	17	57	60	84	8	3	0.0%							depressing
25 Colombia	44	201	270	5	0	0	0.0%							depressing
Total of imports from Extra-EU	6,708	7,902	8,179	8,242	8,304	8,789	Main Importer in 1996			Volume (ton)	Share	Market Growth (96/91)		
							1	Holland	2,554	29%	66%	Whole EU Markets		
							2	UK	2,324	26%	28%	growing at		
							3	Germany	1,537	17%	-7%	31%		

Source : Comite de Liaison Europe Afrique-Caraibes-Pacifique

Table N.1-15 Main Supplying Country of EU Markets(7):Avocado

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996				Trend				
							Share	Destination			Trend			
	1991	1992	1993	1994	1995	1996		Share	Volume (ton)			Share		
1 Israel	41,880	37,445	21,853	20,082	30,749	42,517	38.6%	FRA	95.1%	ITA	2.0%	BEL	1.7%	growing(Dec,Mar)
2 Mexico	9,690	10,423	13,137	19,479	33,077	29,611	26.9%	FRA	62.9%	HOL	18.4%	UK	10.3%	highly growing(Sep-Oct)
3 South Africa	28,550	26,640	19,205	33,569	29,502	26,692	24.2%	BEL	48.0%	UK	19.3%	HOL	16.6%	stable(Jul)
4 Kenya	3,991	6,614	6,019	6,991	8,862	7,687	7.0%	FRA	54.1%	HOL	32.5%	GER	4.5%	growing
5 Canary Islands		87	120	422	1,503	2,046	1.9%	SPA	58.9%	FRA	25.7%	UK	14.9%	newly exporting
6 Dominican Rep.	695	1,000	5,579	205	529	407	0.4%	HOL	85.5%	BEL	9.3%	GER	3.2%	growing
7 USA	494	742	597	484	167	331	0.3%	HOL	44.4%	FRA	44.1%	SWE	5.4%	depressing
8 Brazil	360	356	185	101	126	326	0.3%	FRA	99.7%					depressing
9 Swaziland	715	568	2,383	6	1	107	0.1%	BEL	55.1%	UK	43.0%	GRE	1.9%	depressing
10 Chile	97	249	288	59	257	68	0.1%	HOL	59.8%	BEL	40.2%			depressing
11 Argentina	71	67	24	32	70	51	0.0%	POR	94.1%	UK	5.9%			slightly depressing
12 Venezuela					37	35	0.0%	UK	100.0%					newly exporting
13 St Lucia					47	34	0.0%	UK	100.0%					depressing
14 Jamaica		46	62	74			0.0%	HOL	100.0%					newly exporting
15 Senegal					31	22	0.0%	FRA	100.0%					newly exporting
16 Togo						18	0.0%	HOL	100.0%					newly exporting
17 Bahamas						17	0.0%	ITA	100.0%					newly exporting
18 China						8	0.0%	UK	100.0%					newly exporting
19 St Vincent						7	0.0%	HOL	100.0%					newly exporting
20 Mali		64	643	26	10	5	0.0%							erratic
21 Cote d'Ivoire														
Total of imports from Extra-EU	90,408	87,850	75,042	84,489	105,656	110,172	Main Importer in 1996			Volume (ton)	Share	Market Growth (96/91)		
							1	Holland	68,258	62%	-3%	Whole EU Markets		
							2	UK	15,298	14%	1515%	growing at		
							3	Germany	13,090	12%	-7%	22%		

Source : Comite de Liaison Europe Caraibes-Pacifique

Table N.1-16 Main Supplying Country of EU Markets(8):Melon

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996					Trend		
	1991	1992	1993	1994	1995	Share	Destination						
							Share	HOL	UK	BEL			
1 Brazil	31,847	36,968	47,227	49,634	44,273	36,804	34.6%	UK	58.5%	HOL	40.8%	40.8%	stable
2 Costa Rica	1,485	6,045	4,300	8,353	12,398	20,867	19.6%	UK	89.2%	HOL	34.7%	34.7%	highly growing
3 Israel	12,905	14,292	12,956	13,900	16,749	14,073	13.2%	FRA	36.8%	HOL	32.7%	32.7%	stable
4 Morocco	1,313	2,154	4,918	8,016	7,184	10,238	9.6%	FRA	56.0%	SPA	24.9%	24.9%	highly growing
5 Turkey	4,978	5,256	3,681	5,581	6,110	4,630	4.4%	GER	70.2%	AUS	10.0%	10.0%	stable
6 Honduras	913	696	930	2,299	3,025	4,466	4.2%	HOL	41.8%	BEL	35.9%	35.9%	highly growing
7 South Africa	3,712	3,454	4,724	4,317	3,316	2,739	2.6%	UK	43.3%	HOL	22.4%	22.4%	depressing
8 Ecuador	421	207	159	991	1,349	2,523	2.4%	HOL	78.1%	BEL	12.4%	12.4%	highly growing
9 Guadeloupe	2,497	2,538	2,585	1,982	1,820	1,677	1.6%	FRA	99.9%				depressing
10 Martinique	1,495	1,750	1,446	1,583	1,599	1,569	1.5%	FRA	100.0%				stable
11 Guatemala	2	686	6	218	670	1,459	1.4%	HOL	40.3%	UK	37.8%	37.8%	highly growing
12 Venezuela	855	879	952	485	734	1,141	1.1%	HOL	34.4%	UK	33.5%	33.5%	growing
13 Dominican Rep					1,051	847	0.8%	FRA	51.6%	HOL	29.6%	29.6%	newly exporting
14 Nicaragua					306	502	0.5%	HOL	64.9%	BEL	32.5%	32.5%	newly exporting
15 Tunisia					588	496	0.5%	FRA	99.6%				newly exporting
16 Iran	594	654	576	349	397	477	0.4%	GER	48.4%	HOL	25.2%	25.2%	depressing
17 Chile	432	460	130	283	203	347	0.3%	HOL	43.8%	SPA	41.5%	41.5%	slightly depressing
18 Senegal					203	314	0.3%	HOL	64.6%	BEL	20.1%	20.1%	newly exporting
19 Sudan	442	689	593	933	448	266	0.3%	UK	71.8%	HOL	13.2%	13.2%	depressing
20 Guinea	97	108	3	2	7	103	0.1%	HOL	59.2%	BEL	25.2%	25.2%	newly exporting
21 Argentina						103	0.1%						growing
22 Egypt	110	136	16	21	38	97	0.1%						newly exporting
23 Peru						93	0.1%						erratic
24 USA						87	0.1%						newly exporting
25 Namibia	163	231	251	217	219	51	0.0%						depressing
26 Kenya	119	124	192	57	95	26	0.0%						depressing
27 Malaysia	543	7	11	19	48	25	0.0%						depressing
28 Nigeria						14	0.0%						newly exporting
29 Ethiopia	204	129	22	83	46	12	0.0%						depressing
Total of imports from Extra-EU	67,635	78,937	87,806	101,572	103,782	106,237	Main Importer in 1996			Volume (ton)	Share	Market Growth (96/91)	Whole EU Markets growing at 57%
							1	UK	35%	36,927	35%	20%	
							2	Holland	32%	34,006	32%	154%	
							3	France	15%	15,923	15%	85%	

Source : Comité de Liaison Europe-Afrique-Caraibes-Pacifique



Table N.1-17 Main Supplying Country of EU Markets(9): Strawberry

(Unit : ton)

Country	1991	1992	1993	1994	1995	1996				Trend			
	Share						Destination						
	13,156	15,790	7,993	15,231	7,993	15,790	48.6%	50.0%	HOL		32.7%	DEN	7.1%
1 Poland	28,215	15,425	15,231	7,993	15,790	13,156	GER	50.0%	HOL	32.7%	DEN	7.1%	depressing
2 Morocco	1,441	2,025	5,055	5,619	8,298	6,987	FRA	85.5%	GER	4.2%	SPA	3.4%	highly growing
3 USA	1,845	3,751	2,163	4,503	3,575	4,157	UK	66.9%	FRA	15.4%	GER	14.6%	growing
4 Israel	429	397	646	870	668	1,247	HOL	51.1%	UK	33.4%	GER	11.9%	growing
5 Egypt	60	73	133	161	217	497	UK	39.6%	HOL	32.0%	FRA	12.7%	highly growing
6 Norway					451	323	SWE	84.5%	DEN	12.4%	FIN	3.1%	newly exporting
7 Turkey	80	121	25	22	8	153	UK	91.5%	BEL	6.5%	GER	2.0%	growing
8 Mexico	1,211	594	380	207	127	131	FRA	64.9%	GER	34.4%			depressing
9 Kenya	339	195	125	58	13	118	HOL	97.5%	UK	2.5%			depressing
10 Slovenia						117	AUS	100.0%					newly exporting
11 Australia					127	48	UK	95.8%	HOL	2.1%	GRE	2.1%	newly exporting
12 Switzerland						22	FRA	68.2%	ITA	22.7%	UK	4.5%	newly exporting
13 Estonia					8	17	FIN	100.0%					newly exporting
14 India						16	UK	62.5%	HOL	37.5%			newly exporting
15 Hungary	45	35		181	276	16	AUS	100.0%					erratic
16 Gaza					3	13	HOL	92.3%	FRA	7.7%			newly exporting
17 Senegal						10	GER	100.0%					newly exporting
18 Canada	38	33	34	17	27	6	UK	50.0%	GER	50.0%			depressing
19 New Zealand	852	1,002	363	36	4	5	UK	100.0%					depressing
20 Colombia					13	3		0.0%					depressing
21 Zimbabwe						3		0.0%					newly exporting
22 Saudi Arabia	112	47	19	6		3		0.0%					newly exporting
23 Ecuador	1,209	149	171	1,038	297	1		0.0%					depressing
24 Romania	1,082	38	2			0		0.0%					depressing
25 Bulgaria													depressing
Total of imports from Extra-EU	37,347	24,092	24,523	21,098	30,045	27,055	1 UK 2 Holland 3 France						Market Growth (96/91) Whole EU Markets depressing at -28%

Source : Comité de Liaison Europe-Afrique-Caraibes-Pacifique

Table N.1-18 Main Supplying Country of EU Markets(10):Rose

(Unit : thousand ECU)

Country	1991	1992	1993	1994	1995	1996			Trend						
							Share	Destination							
1 Kenya	3,821	5,546	8,239	18,300	27,426	40,262	24.3%	HOL	69.9%	GER	13.8%	UK	8.1%	highly growing	
2 Israel	20,261	22,465	24,372	38,932	28,423	37,335	22.5%	HOL	73.4%	GER	14.6%	UK	6.3%	growing	
3 Zimbabwe	5,070	10,154	11,907	13,499	22,728	28,310	17.1%	HOL	71.9%	GER	16.5%	GER	8.0%	highly growing	
4 Ecuador	1,945	3,679	6,127	9,457	14,282	17,645	10.6%	HOL	38.7%	ITA	31.4%	GER	17.1%	highly growing	
5 Colombia	4,676	7,699	9,653	10,215	21,401	13,747	8.3%	ITA	20.5%	UK	20.0%	SPA	17.0%	growing	
6 Zambia	723	1,367	2,012	2,845	3,670	6,328	3.8%	HOL	88.8%	GER	4.4%	ITA	3.5%	highly growing	
7 India	3	66	88	198	1,160	3,668	2.2%	HOL	71.9%	GER	19.8%	UK	7.6%	highly growing	
8 Tanzania	14	504	504	1,702	2,738	3,517	2.1%	HOL	52.0%	GER	41.4%	SWE	4.8%	highly growing	
9 Morocco	9,026	7,903	5,935	5,355	4,620	3,185	1.9%	FRA	66.0%	ITA	24.3%	POR	2.3%	depressing	
10 Uganda			14	991	2,118	3,117	1.9%	HOL	82.4%	GER	11.4%	SWE	3.5%	highly growing	
11 Malawi	94	519	808	1,263	2,029	2,561	1.5%	HOL	72.7%	GER	27.3%	POR	8.1%	highly growing	
12 South Africa	148	204	405	466	517	793	0.5%	HOL	61.8%	UK	16.3%	POR	8.1%	highly growing	
13 Brazil	2,501	2,960	3,094	2,121	1,739	287	0.2%	GER	82.6%	POR	16.4%			depressing	
14 Turkey	36	17	72	16	114	261	0.2%	UK	98.9%					highly growing	
15 Swaziland				178	268	189	0.1%	GER	89.4%	HOL	10.6%			newly exporting	
16 USA	42	87	189	971	694	146	0.1%	HOL	78.1%	GER	10.3%	ITA	9.6%	slightly growing	
17 Costa Rica		240	321	93	33	139	0.1%	HOL	82.0%	GER	10.1%	SWE	2.9%	erratic	
18 Mexico	611	445	371	224	223	134	0.1%	HOL	41.0%	GER	17.9%	ITA	17.9%	depressing	
19 Nigeria			17	137	106	89	0.1%	FRA	48.3%	GER	41.6%			depressing	
20 Guatemala		12	3	16	74	53	0.0%	SWE	77.4%	SPA	13.2%	GER	9.4%	newly exporting	
21 New Zealand						9	0.0%							depressing	
Total of imports from Extra-EU	56,365	69,977	79,610	102,955	130,870	165,897	Main Importer in 1996			Volume (ton)	Share	Market Growth (96/91)			
							1	Holland		100,675	61%	469%	Whole EU Markets		
							2	Germany		25,939	16%	36%	highly growing at		
							3	UK		11,562	7%	71%	194%		

Source : Comité de Liaison Europe-Afrique-Caraïbes-Pacifique

Table N.1-19 Main Supplying Country of EU Markets(11):Carnation

(Unit : thousand ECU)

Country	1991	1992	1993	1994	1995	1996				Trend				
						Share	Destination							
							GER	HOL	UK					
1 Colombia	66,864	77,231	81,139	72,737	75,766	75,190	59.3%	UK	48.1%	GER	15.9%	HOL	10.5%	stable
2 Kenya	18,139	19,652	22,771	25,280	21,258	17,493	13.8%	HOL	42.8%	GER	33.8%	UK	23.2%	slightly depressing
3 Israel	20,512	17,779	14,275	10,849	10,870	12,886	10.2%	HOL	78.9%	GER	9.3%	UK	8.9%	depressing
4 Turkey	8,901	9,228	9,730	10,322	9,641	11,243	8.9%	UK	86.6%	HOL	5.8%	GER	4.5%	slightly growing
5 Morocco	1,176	2,619	3,255	3,511	4,781	5,705	4.5%	UK	41.6%	GER	21.9%	FRA	18.2%	highly growing
6 Ecuador	398	565	1,104	1,003	1,468	2,005	1.6%	GER	48.2%	UK	27.0%	HOL	13.7%	highly growing
7 Guatemala	117	188	817	787	753	980	0.8%	GER	46.3%	UK	37.8%	HOL	13.9%	highly growing
8 USA	424	178	132	255	272	358	0.3%	HOL	59.5%	UK	15.6%	GER	12.8%	growing
9 Zimbabwe	55	111	72	205	395	146	0.1%	GER	85.6%	UK	8.2%	FRA	3.4%	growing
10 Egypt						79	0.1%	HOL	100.0%					newly exporting
11 Malawi					42	42	0.0%	GER	100.0%					newly exporting
12 Tanzania						30	0.0%	GER	71.4%					newly exporting
13 Uganda						26	0.0%	HOL	53.8%	GER	46.2%			newly exporting
14 India						22	0.0%	GER	100.0%					newly exporting
15 Thailand						20	0.0%	GER	55.0%	ITA	40.0%	SPA	5.0%	newly exporting
16 Chile					62	62	0.0%	GER	94.7%	FIN	5.3%			newly exporting
17 Saudi Arabia					65	17	0.0%	UK	82.4%	FIN	17.6%			newly exporting
18 Canada					11	15	0.0%	AUS	53.3%	UK	46.7%			newly exporting
19 Costa Rica					30	14	0.0%	HOL	50.0%	UK	28.6%	SWE	14.3%	newly exporting
20 South Africa	9	25	24	24	73	12	0.0%	UK	75.0%	GER	16.7%			newly exporting
Total of imports from Extra-EU	119,280	129,681	133,958	125,606	125,515	126,700	Main Importer in 1996			Volume (ton)	Share	Market Growth (96/91)		
							1	Holland		100,675	79%	19%	Whole EU Markets	
							2	Germany		25,939	20%	3%	stable at	
							3	UK		11,562	9%	-3.5%	6%	

Source : Comité de Liaison Europe-Afrique-Caraïbes-Pacifique

Table N.1-20 Main Supplying Country of EU Markets (12) : Other Fresh Flowers

(Unit : thousand ECU)

Country	1991	1992	1993	1994	1995	1996				Trend	
						Share	Destination				
							Share	Volume (ton)	Share		
1 Israel	48,364	49,472	51,982	66,436	68,655	86,064	55.2% HOL	75.1% UK	10.8% GER	9.4% GER	growing
2 Kenya	15,687	18,039	20,515	13,363	26,082	25,636	16.5% HOL	80.8% UK	10.7% GER	6.2% GER	growing
3 Zimbabwe	6,546	10,920	10,790	13,638	12,554	11,228	7.2% HOL	90.5% UK	5.8% FRA	1.2% FRA	growing
4 Ecuador	907	1,592	2,676	4,490	5,626	6,788	4.4% ITA	35.8% GER	20.4% HOL	19.8% HOL	highly growing
5 South Africa	6,482	5,716	5,496	5,007	5,415	5,139	3.3% GER	38.8% HOL	35.3% ITA	8.0% ITA	slightly depressing
6 Colombia	2,799	4,248	3,669	4,293	5,379	3,892	2.5% UK	33.1% FRA	20.7% SWE	17.2% SWE	slightly growing
7 Costa Rica	584	1,478	2,015	2,677	3,224	3,202	2.1% GER	42.6% HOL	30.7% FRA	19.6% FRA	growing
8 Peru	3,757	4,404	2,484	3,020	3,579	3,105	2.0% ITA	35.1% FRA	31.4% GER	27.7% GER	slightly depressing
9 Cote d'Ivoire	1,204	1,380	1,417	1,822	1,502	1,632	1.0% HOL	32.2% FRA	31.3% GER	25.6% GER	slightly growing
10 Mauritius	2,161	2,078	1,858	1,569	1,578	1,367	0.9% ITA	76.7% FRA	19.3% GRE	1.8% GRE	depressing
11 Australia	1,078	1,336	1,296	1,499	1,372	1,344	0.9% HOL	74.0% GER	23.3% FRA	1.7% FRA	slightly growing
12 New Zealand	595	708	915	808	944	950	0.6% HOL	36.8% GER	34.0% ITA	6.8% ITA	growing
13 Zambia	367	421	424	576	682	474	0.3% HOL	89.7% GER	5.3% FRA	3.0% FRA	slightly growing
14 USA	775	575	355	685	677	441	0.3% HOL	63.9% GER	31.7% ITA	1.8% ITA	depressing
15 Martinique	621	457	312	314	378	400	0.3% FRA	93.3% ITA	6.5% ITA	4.4% ITA	slightly depressing
16 Tanzania	339	810	650	110	474	298	0.2% HOL	83.6% GER	8.1% UK	4.4% UK	depressing
17 Cameroon						201	0.1% FRA	99.0% ITA	1.0% ITA		newly exporting
18 Egypt	7	37	39	133	204	165	0.1% ITA	74.5% HOL	24.8% HOL		newly exporting
19 Surinam	178	434	519	140	193	147	0.1% HOL	100.0% GRE			highly growing
20 Morocco	101	91	148	155	169	134	0.1% FRA				depressing
21 Jamaica	1,339	1,263	369	1,035	373	111	0.1% ITA				slightly growing
22 Ethiopia											depressing
Total of imports from Extra-EU	96,836	108,771	110,512	124,338	142,103	155,815	Main Importer in 1996			Market Growth (96/91)	
							1 Holland	Volume (ton)	Share	83%	Whole EU Markets
							2 Germany	104,042	67%	-7%	growing at
							3 UK	17,876	11%	88%	61%
								14,494	9%		

Source : Comité de Liaison Europe-Afrique-Caraïbes-Pacifique

N.B. : 'Other Fresh Flowers' include Gypsophyllia, Limonium, Solidago, Chamaelaucium, Hypericum, Aster, Alstromeria, Helianthus, Asclepia, Heliconia, Anthurium, Ginger, etc.

Table N.1-21 Import of Horticultural Produce(1995)

Country	Value (Kshs)										Total	Volume (kg)	
	Legume	Root	Leaf	Vegetables		Fruits			Flowers	Sub-total			
			Fruit	Mashroom	Others	Sub-total	Fresh	Nut	Others	Sub-total	Sub-total		
Australia			38,857			38,857	315,574			315,574	315,574	5,220	
Belgium						0				0	86,365	464	
Bahrain						0				0	4,915	6	
Canada	29,400,437					29,400,437	5,556,025			5,556,025	35,022,290	786,285	
China	39,163,447					39,163,447				0	39,163,447	1,506,230	
Egypt						0	256,139			352,207	352,207	3,692	
France	1,538,488	953,004			185,345,574	2,491,492	4,807,423			4,856,762	22,905,936	229,516	
Germany						0	1,319,961			1,319,961	1,319,961	176,675	
Greece						3,751,696				0	3,751,696	21,100	
Hongkong	2,764,459		987,237			272,434	1,659,311	752,927	108,761	2,520,999	3,751,696	19,201	
India	5,317	267,117				0	641,572		366,341	1,007,913	2,793,433	55,649	
Iran	594,385	359,368				953,753	4,463,249			4,463,249	1,007,913	33,600	
Israel	21,721	7,528	105,672			142,996	348,053	23,559		371,612	239,091,797	369,408	
Italy						12,296				0	1,695,290	20,441	
Japan					208		874,553			874,553	12,296	60	
Madagascar						0				0	874,553	16,876	
Morocco						0				0	4,077,971	3,934	
Netherlands	5,075,318	40,198	8,862		145,897	5,270,275	299,940			299,940	114,650,157	138,337	
New Zealand	8,983,910					8,983,910				0	9,428,095	60,300	
Oman						0			4,500	4,500	4,500	2,250	
Pakistan	92					92	354,245	334,019		688,264	688,356	8,869	
Saudi Arabia						0	2,198,255	428,341		2,626,596	2,626,596	97,258	
Singapore						0				0	15,320	51	
South Africa	3,320,966		9,738	351,164	3,394	3,728,361	51,908,680		167,811	52,076,491	57,267,207	1,919,038	
South America						0				0	91,917	148	
Spain						0	83,166			83,166	2,538,732	9,555	
Taiwan				13,368	12,922	26,290				0	26,290	24	
Tanzania	123,892	25,290				149,182		3,670,737		3,670,737	3,916,626	186,562	
UAE	49,631	13,175		3,923	71,661	138,390	154,538		1,763,537	1,918,075	3,513,516	228,287	
Uganda		3,072,405				3,072,405	164,681			164,681	3,268,221	326,688	
UK	44,523	475,089	118,050		241,123	878,785	2,508,771	311,913	363,539	3,184,223	14,494,214	53,925	
USA	2,144,711					2,144,711	3,312,123	5,055,546		8,367,669	11,670,739	143,343	
<b>Total</b>	<b>93,231,297</b>	<b>5,213,955</b>	<b>115,410</b>	<b>216,943</b>	<b>1,366,999</b>	<b>185,820,779</b>	<b>81,226,259</b>	<b>10,577,042</b>	<b>2,972,319</b>	<b>94,775,620</b>	<b>387,647,253</b>	<b>768,388,256</b>	<b>6,422,992</b>

Source : HCDA and JICA Study Team

Table N.1-22 Import of Horticultural Produce(1994)

Country	Value (Kshs)										Flowers		Volume (kg)	
	Legume	Root	Leaf	Vegetables Fruit	Mushroom	Others	Sub-total	Fresh	Nil	Others	Sub-total	Sub-total		Total
Australia						15,953	15,953			278,525	0	409,643	704,121	15,763
Belgium	5,128,993					5,128,993	5,128,993				0	5,128,993	5,128,993	329,425
Canada	2,141,878					2,141,878	2,141,878				0	60,641	2,202,519	9,357
Cyprus				1,172			1,172	95,150		361	95,150	95,150	95,150	3,560
Denmark								2,229		202,931	2,590	3,762	3,762	10
Egypt								529,368			732,299	732,299	732,299	12,001
France	607,173	1,347,110				1,954,283	4,330,797	4,330,797			4,330,797	25,808	6,310,888	175,169
Germany					110,757,311	110,757,311	52,690	52,690			52,690	1,727,755	112,537,756	144,259
Greece							1,022,788	1,022,788			1,022,788	1,022,788	1,022,788	26,341
India		358,016			37,265	395,281	682,925	505,344	6,711		1,194,980	1,590,261	60,446	60,446
Iran							1,585,470	4,219,818			5,805,288	5,805,288	5,805,288	22,094
Ireland							128,686	128,686			128,686	128,686	128,686	400
Israel							2,954,229	2,954,229			2,954,229	105,229,178	108,183,407	212,650
Italy	27,484,613					27,484,613	101,341	101,341			101,341	2,406,370	29,992,324	62,532
Japan	3,432					3,432	3,432	3,432			0	3,432	3,432	5
Netherlands	221,653					221,653	221,653	221,653			37,693	37,693	176,650,306	56,148
Oman	52,266	1,384				53,650	53,650	280,695			942,125	5,100	947,225	3,412
Pakistan							83,316	83,316			0	83,316	83,316	36,655
Portugal		83,316					68,490	68,490			0	7,063	87,332,602	600
Saudi Arabia							0	0			87,264,112	7,063	87,332,602	2,256,031
Singapore							0	0	901,333		901,333	1,091,244	908,396	2,504
South Africa							81,594	27,203,460	901,333		27,203,460	1,091,244	28,376,298	1,083,958
South Korea						354,363	354,363	354,363			0	354,363	354,363	1,185
Spain				104,939		104,939	104,939	58,913			58,913	57,505	221,357	18,805
Switzerland							0	0			0	5,276	5,276	80
Tanzania	38,250	13,500				51,750	51,750	50,000	50,000		50,000	151,380	253,130	48,750
Thailand							0	0			0	104,814	104,814	72
UAE	25,590					36,740	36,740	240,021	1,531,989		1,772,010	1,808,750	1,808,750	151,880
Uganda	9,659,529					9,659,529	29,991	29,991			29,991	9,689,520	9,689,520	480,170
UK	214,649					792,331	2,532,067	113,674	218,786		2,864,527	1,151,603	4,808,461	92,383
USA	14,153,949					116,024	14,313,392	2,017,831	74,394		3,309,953	1,021,529	18,644,874	890,439
Zambia						0	0	0			0	2,814	2,814	138
Zimbabwe						0	0	0			0	7,300	7,300	107
<b>Total</b>	<b>59,731,975</b>	<b>1,958,764</b>	<b>62,855</b>	<b>205,072</b>	<b>1,510</b>	<b>111,675,997</b>	<b>173,636,173</b>	<b>42,913,767</b>	<b>8,616,154</b>	<b>89,672,049</b>	<b>141,201,970</b>	<b>289,893,676</b>	<b>604,731,819</b>	<b>6,197,329</b>

Source: HCDA and JICA Study Team

Table N.1-23 Price Fluctuation in Season and Region by Market and Crop (October, 1994-July 1998)

Crop	Trading Unit	Weight (kg)	Market Prices at Nairobi (Wakulima Wholesale Market)			Market Prices at Meru/Karatina			Seasonal Fluctuation										Affection to Market by Drought (Mar-May, 97)							
			Highest per unit (Kshs)	Lowest per unit (Kshs)	Mean per unit (Kshs)	Annual Average			Ratio to Nairobi (%)		Coefficient of Variation (-Standard Deviation / Mean)					Prices Fluctuation										
						in 1995 (Kshs)	in 1996 (Kshs)	in 1997 (Kshs)	in 1998 (Kshs)	Meru (Kshs)	Karatina (Kshs)	Nairobi	Mombasa	Nakuru	Kijale	Kisumu	Elabret	Meru		Karatina	General Status	Month				
Avocado	bag	89.1	1,180	574	813	754	771	919	830	379	536	47	66	0.167	0.217	0.188	0.208	0.442	0.269	0.396	0.291	stable				
Banana, Cooking	med. bunch	13.8	259	138	170	158	164	171	206	119	174	70	103	0.169	0.288	0.165	0.382	0.459	0.142	0.493	0.371	stable				
Banana, Ripe	med. bunch	22.0	529	200	352	328	359	365	387	352	405	100	115	0.142	0.073	-	0.123	0.457	0.131	0.336	0.312	stable				
Bean, Canadian Wonder	bag	90.0	5,843	1,722	2,893	2,020	2,245	4,153	3,594	3,194	3,255	110	113	0.378	0.328	0.437	0.480	0.415	0.418	0.427	0.325	very fluctuated	Jun-Jul			
Bean, Dolicho	bag	90.0	6,762	1,992	3,606	2,788	2,997	4,742	4,397	3,714	3,769	103	105	0.332	0.277	0.175	-	0.504	0.332	0.363	0.363	very fluctuated	Jun-Jul, Nov			
Bean, Mwitani	bag	90.0	5,888	1,246	2,593	1,566	2,264	4,115	2,493	2,206	2,483	85	96	0.454	0.462	0.445	0.560	-	0.504	0.569	0.563	very fluctuated	May, Dec			
Bean, Rose Coco	bag	90.0	5,898	1,895	3,027	2,053	2,386	4,309	3,878	2,539	2,921	84	96	0.362	0.352	0.447	0.380	0.447	0.420	0.430	0.439	very fluctuated	June, Nov-Dec			
Brinjal	bag	43.6	1,140	457	688	653	657	716	756	417	417	61	61	0.155	0.479	0.358	0.349	-	0.669	0.560	0.571	very fluctuated	irregular			
Cabbage	ext. bag	126.2	2,585	512	1,205	942	1,087	1,553	1,500	804	404	67	33	0.423	0.418	0.646	0.547	0.857	0.276	0.276	0.523	very fluctuated	Feb, Jun-Aug			
Capsicum	bag	51.8	2,314	578	1,131	803	1,116	1,407	1,465	1,100	710	97	63	0.347	0.380	0.316	0.221	-	0.276	0.534	0.579	very fluctuated	Jun-Aug			
Carrot	ext. bag	117.0	5,419	450	1,175	952	923	1,801	1,038	743	1,128	63	96	0.742	0.605	0.517	0.368	0.132	0.534	0.275	0.579	very fluctuated	Jun-Aug			
Cassava, Fresh	bag	98.8	1,261	394	813	506	753	1,033	967	850	683	105	84	0.314	0.312	0.258	0.353	0.587	-	0.206	-	fluctuated	Mar-Apr			
Cauliflower	small bkt.	38.9	1,253	354	596	599	585	628	574	1,200	800	201	201	0.287	0.437	0.258	-	-	0.206	-	-	very fluctuated	irregular			
Chilli	bag	49.0	6,010	1,799	2,921	2,297	2,615	3,827	2,871	2,721	2,988	93	102	0.273	0.417	0.218	0.228	-	0.209	0.329	0.308	fluctuated	irregular			
Cowpea	bag	50.9	1,494	500	730	614	716	806	874	800	800	110	95	0.275	0.436	0.260	-	-	0.276	-	-	very fluctuated	irregular			
Cucumber	bag	90.0	7,995	1,828	3,419	2,437	2,814	4,928	3,520	3,190	3,233	93	95	0.403	0.466	0.377	0.227	0.403	0.276	0.514	0.507	very fluctuated	irregular			
Green Gram	bag	110.0	6,686	3,055	4,993	4,371	4,610	5,648	5,863	3,602	4,200	72	84	0.166	0.204	0.194	0.171	0.269	0.380	0.257	-	stable				
Ground Nut Shell	bag	90.0	1,471	152	372	261	294	561	436	302	259	81	70	0.664	0.488	0.789	0.627	0.710	0.711	0.368	0.671	very fluctuated	Feb-Mar			
Kale, Sukuma Wiki	bag	93.0	1,334	475	818	638	687	1,123	840	400	900	49	110	0.294	0.302	0.185	0.199	0.407	0.165	-	-	fluctuated	irregular			
Lernon	bag	50.0	1,993	258	543	393	499	814	486	800	800	147	72	0.299	0.481	-	-	-	-	-	-	very fluctuated	irregular			
Lettuce	bag	50.0	589	187	326	295	334	380	322	235	350	72	107	0.263	0.187	0.353	0.415	0.363	0.397	0.311	0.289	fluctuated	irregular			
Linne	net	90.0	1,523	684	1,041	784	912	1,408	1,139	974	1,028	94	99	0.319	0.334	0.400	0.312	0.261	0.425	0.317	0.416	very fluctuated	Feb-Mar			
Maize, Dry	ext. bag	114.6	3,353	956	1,681	1,302	1,651	2,133	1,496	839	907	50	54	0.419	0.398	0.276	0.234	0.230	0.214	0.317	0.550	very fluctuated	Apr, Oct			
Maize, Green	bag	50.0	1,659	354	793	683	787	899	898	425	525	54	66	0.262	0.395	0.323	-	-	0.276	-	-	fluctuated	irregular			
Mango, Local	bag	50.0	1,100	412	640	515	569	756	756	813	480	75	75	0.262	0.395	0.323	-	-	0.276	-	-	fluctuated	irregular			
Millet, Finger	bag	90.0	2,278	1,179	1,689	1,465	1,562	2,002	1,888	2,972	2,159	176	128	0.179	0.149	0.257	0.287	0.258	0.296	0.219	0.151	stable				
Onion, Dry Bulb	bag	13.2	1,047	155	342	234	259	339	741	283	380	83	111	0.594	0.646	0.576	0.495	0.335	0.781	0.419	0.626	very fluctuated	May			
Onion, Spring	net	141.7	3,020	658	1,251	818	1,089	1,296	2,225	864	740	69	59	0.423	0.497	0.283	0.211	0.388	0.458	0.405	0.381	very fluctuated	May, Aug			
Orange	bag	93.1	2,227	878	1,597	1,353	1,600	1,597	1,601	1,000	1,331	67	89	0.237	0.327	0.250	0.245	0.266	0.344	0.311	0.291	fluctuated	Aug			
Passion Fruit	bag	57.4	1,625	500	1,124	1,050	992	1,226	1,456	521	592	46	53	0.288	0.230	0.240	0.217	0.507	0.287	0.284	0.284	fluctuated	irregular			
Pawpaw	large box	53.7	733	381	500	444	450	550	627	186	493	37	99	0.187	0.284	0.185	0.165	0.500	0.224	0.224	0.526	stable				
Pea, Fresh	bag	51.3	3,726	692	1,277	1,045	1,058	1,685	1,569	1,189	1,433	93	112	0.493	0.408	0.420	0.516	0.197	0.413	0.470	0.375	very fluctuated	May-Jun			
Pinapple	dozen	11.8	386	150	299	287	312	309	332	171	242	57	72	0.158	0.302	0.283	0.418	0.347	0.309	0.369	0.369	stable				
Potato, Red Irish	bag	130.0	2,725	625	1,103	802	921	1,334	1,552	1,133	1,262	103	114	0.395	0.399	0.691	0.530	0.412	0.555	0.306	0.306	very fluctuated	irregular			
Potato, Sweet	bag	98.0	1,631	614	1,109	830	881	1,399	1,471	508	683	46	62	0.265	0.318	0.200	0.427	0.839	0.399	0.616	0.307	fluctuated	irregular			
Potato, White Irish	bag	130.0	2,993	600	1,135	731	930	1,350	1,764	1,113	1,109	98	98	0.476	0.405	0.696	0.542	0.424	0.568	0.474	0.280	very fluctuated	irregular			
Sorghum	bag	90.0	2,173	916	1,485	1,146	1,260	1,963	1,788	1,215	1,325	82	79	0.264	0.158	0.332	0.288	0.457	0.261	0.474	0.480	fluctuated	irregular			
Tomato	box	63.6	2,814	606	1,222	909	1,094	1,269	2,100	891	960	73	89	0.408	0.440	0.601	0.353	0.455	0.355	0.462	0.555	very fluctuated	Apr-May			

Source : JICA Study Team based on data issued by Market Information Branch, Farm Management Division, MOA/D&M