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Konedobu

STATISTICAL REPORT ON THE EASTERN HIGHLANDS
PROVINCIAL SMALLHOLDER CROP SURVEY 1979/80INTRODUCTION

1. The Eastern Highlands Provincial Smallholder Crop Survey was the third one to start in a series of crop surveys designed to meet some of information requirements at provincial levels, the previous ones being in East Sepik and New Ireland provinces. As in case of other provinces, the sampling design was a two-stage one in which villages were selected from each district with a probability proportional to estimated size or "p.p.e.s." as first stage units. From each selected village, five crop-growing households were selected again as second stage sampling units. Initially it was decided to select 10 villages in each of six districts of Eastern Highlands province, namely Goroka, Henganofi, Kainantu, Lufa, Marawaka and Okapa. Due to administrative considerations, however, as well as due to the fact that comparatively less coffee is grown in Marawaka, the number of villages for selection in this district was reduced to 8, thus bringing the total number of villages selected to 58.

2. The information collected from each selected household was on the main cash crop, i.e., coffee (arabica) - numbers of households, gardens, trees (with breakdown according to maturity), area as well as management indicators; food gardens - numbers of households, gardens area as well as indicators of crop intensity.

3. The field work for the survey started in January, 1980 following a training workshop at Goroka during December, 1979 and was completed by May, 1980 mainly due to active assistance from the provincial staff. As in other provinces, the field personnel and other support were provided by the provincial authority while the DPI Rural Statistics Section was involved in the planning and design, training and overall supervision, analysis and publication of results.

RESULTS

4. The following tables (1-4) show the provisional results from the above survey. Table 1 provides the information (district-wise) on numbers of households, gardens, area, numbers of trees - breakdown into bearing, immature and senile as well as numbers of trees affected by diseases and pests. Table 2 provides the percentage distribution of coffee trees affected by various diseases and pests. Table 3 shows some basic management indicators in coffee gardens like cleaning, pruning, fencing and extent of shades and Table 4 deals with food crops - households, numbers of gardens and area as well as percentage of gardens growing different food crops.

COFFEE, ARABICA

5. The survey results show (Table 1), there is an estimated number of 47,220 households, in the province growing arabica coffee, one-third of whom are from Goroka, 19% from Henganofi, 18% from Okapa, 17% from Kainantu, 10% from Lufa and only 3% from Marawaka district. In all there are an estimated 92,799 coffee gardens in the province accounting for a total area of 12,154 hectares which means a garden in the province has an average area of 0.13 ha. For the sake of comparison, the average area per garden in Goroka district is 0.17ha, that for Henganofi is 0.10ha, Okapa - 0.07ha, Kainantu - 0.13ha, Lufa - 0.10ha and for Marawaka it is 0.08ha. The survey results show apparently more fragmentation as one goes away from the urban areas. If the relative proportion of area under coffee is considered, Goroka by far dominates with 58% of total area, the contribution from other districts combined being only 42% (Henganofi - 14%, Kainantu - 12%, Okapa - 8%, Lufa - 7% and Marawaka less than one percent of total area).
6. The total number of coffee trees in the province is estimated to be 29.2 million, of which 14.9 million or just over half are only in Goroka district. All other five districts together constitute 49% of total trees with Henganofi - 4.2 million (14% of total), Kainantu - 3.4 million (12%), Okapa - 3.3 million (11%), Lufa - 3.0 million (10%) and Marawaka only about 350,000, just over one percent of the total. Nearly 70% of the total number of trees in the province are bearing, one-fourth immature and just about 6% senile. Goroka district has comparatively less bearing (64%) and more senile - (9%) trees whereas there are less senile trees in Henganofi and Lufa districts (not exceeding 2%), bearing trees for both districts being 78% of respective totals in districts.

7. The average number of trees in a garden is observed to be 314 for the whole province and the overall density is 2,400 trees per hectare. Goroka has comparatively larger (tree-wise) gardens with an average of 365 trees and, at the same time, the least tree density, 2,100 trees per hectare. The average garden size (number of trees per garden) and average density (trees per hectare) for other districts respectively are as follows: Henganofi - 256 and 2,570; Kainantu - 293 and 2,250; Lufa - 329 and 3,450; Okapa - 248 and 3,510 and Marawaka - 227 and 2,900.
8. Some doubts have been expressed by provincial authority on the present survey results as it is claimed that Kainantu district has more coffee than Henganofi though the results show otherwise. It may be necessary to investigate the accuracy of this claim from other sources, e.g., district production estimates or 1980 National Population Census figures. It would, nevertheless, be relevant to point out here that the district results are based on only 10 villoges and are, therefore, to be considered as indicative results only.
9. Total number of trees affected by pests and disease is estimated to be about 1.1 million or 4% of trees in the province. An estimated 468,000 or 41% of these trees are in Goroka district; Okapa, Henganofi and Kainantu have each about 15% of total diseased trees whereas the percentages in Lufa and Marawaka are 9 and 4 respectively.

DISEASES AND PESTS

10. Table 2 deals with the percentage distribution of trees affected by diseases and pests. Eastern Highlands is comparatively disease-free among the provinces surveyed. The only diseases causing some damage being pink disease, sun scorch and thread blight and ring/stem borer being the only significant pest. Except in Marawaka, all other districts have 5% or less trees affected. In Marawaka, the percentage is relatively high at 12% with sun scorch (5%) and ring/stem borer (5%) causing most damages. This is possibly due to inaccessibility of some gardens at difficult terrains in the district.
11. Some doubts have also been expressed in the percentages of trees affected by pests and diseases. ~~the~~ incidences of pink disease and ring/stem borer have not been adequately reflected in the survey results. It has been claimed that percentages of trees affected by these two diseases/pests were expected to be generally more in the districts than indicated in the survey results.

MANAGEMENT INDICATORS

12. Table 3 provides some information on management practices in coffee gardens, i.e., cleaning, pruning, fencing and shades. While about half of the gardens in the province are clean, the same can not be said about other indicators. On a provincial scale, only about one-fourth of the gardens are pruned or fenced while less than

half (41%) of the gardens have proper shading, the remaining having other too little (36%) or too much (23%) of shade. Considering the cases of districts, Goroka and Lufa districts have only 41% of the gardens clean while Henganofi boasts more than three-fourths of its gardens to be clean. The worst record of pruning (only 13% of gardens) is held by Lufa district while Henganofi again has comparatively better performance with 37% of gardens being pruned. (Marawaka district is left out of this comparison as it has only 2% of coffee gardens in the province). Henganofi has, however, a bad record in fencing - along with Lufa - hardly one-fifth of the gardens are fenced. On the other hand, this is the only district where more than half (56%) of the gardens have proper shades while the worst record (leaving aside Marawaka district) is held by Lufa, less than one-third of whose gardens have proper shading. Overall management-wise, the gardens of Lufa are worst managed while Henganofi appears to be comparatively better.

FOOD GARDENS

13. Table 4 shows the numbers of households, food gardens, area as well as crops grown in the gardens with their relative percentages. The total number of households was estimated to be 57,188 cultivating 78,635 food gardens which means an average of 1.38 gardens per household. The total area under food gardens was estimated to be 13,454 hectares (ha), i.e., the average size of a food garden is 0.17ha. Out of the total of 78,635 gardens in the province, about one-third (32%) are in Goroka, 21% in Kainantu, 20% in Okapa, 16% in Henganofi,

8% in Lufa and only 3% in Marawaka districts. The average number of food gardens per household and average area of a garden in the districts are respectively as follows: Goroka - 1.45, and 0.21ha; Kainantu - 1.49 and 0.21ha; Okapa - 1.36 and 0.24ha; Henganofi - 1.38 and 0.19ha; Lufa - 1.0 and 0.04ha and Marawaka - 1.35 and 0.09ha. Except in Lufa and Marawaka districts, there is little variation in these two indicators for the rest of the province.

14. Sweet potato is the most important food crop where two-thirds of all gardens grow this crop. Next are sugarcane and pitpit (both grown in 60% of the gardens), followed by "mau" (sweet eating) banana (52%), cooking banana (48%), corn (45%), pumpkin and moku (both 42%) and taro "tru" (40% of all gardens). Although sweet potato is the most important food crop in all districts except Henganofi, there is, however, some variation in cultivation practices between districts. The most important food crops in Goroka are: sweet potato (grown in 58% of gardens), sugarcane (47%), cassava (46%), pitpit (44%) and birds-eye chillies (41%). Those in Kainantu are: sweet potato (67% of gardens), pitpit (59%), sugarcane (52%); Okapa - sweet potato (87%), pitpit (86%), sugarcane (82%) and moku (79%); Henganofi - sugarcane (53%), "mau" banana (50%) and cooking banana (47%); Lufa - sweet potato (all gardens), pitpit (98%), and sugarcane (86%) - and lastly Marawaka - sweet potato (72%), pitpit and sugarcane (both 71%). It is apparent from the above table that sweet potato, sugarcane and pitpit are grown extensively in most parts of the province.

CONCLUSION

15. This is the third statistical report on the series of Provincial Smallholding Crop Surveys conducted by the Rural Statistics Section, the previous ones being those for East Sepik and New Ireland provinces (RSB 1981/4 and 1981/5). As in the earlier reports, the results are estimates based on moderate sized samples and are liable to have margins of errors. Enquiries on this report should be directed to the undersigned (Phone: 214178) or Z. Waliji (Phone: 212873) of the Rural Statistics Section of DPI.

C. KOLEY
Rural Statistician.

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Symbols used: - nil or negligible.

(1)

TABLE 1 COFFEE, ARABICA : NUMBER OF HOUSEHOLDS, GARDENS, TREES, ETC.

DISTRICT	Number of Households	Number of Gardens	Area of Gardens (Hectare)	Number of Trees by Age Classification ('000)				Trees Affected by Diseases and Pests ('000)
				Bearing	Immature	Senile	Total	
Goroka	15,939	40,848	7,086	9,598	3,960	1,358	14,916	468
Henganofi	8,811	16,265	1,621	3,225	888	52	4,165	173
Kainantu	7,935	11,542	1,504	2,399	886	92	3,377	166
Lufa	4,870	9,222	880	2,376	600	60	3,036	105
Marawaka	1,234	1,533	120	189	147	12	348	42
Okapa	8,431	13,389	943	2,425	769	120	3,314	176
PROVINCE	47,220	92,799	12,154	20,212	7,250	1,694	29,156	1,130

(ii)

TABLE 2 COFFEE, ARABICA : PERCENTAGE DISTRIBUTION OF TREES AFFECTED BY DISEASES AND PESTS (1)

(Percentage of trees)

DISTRICT	Diseases					Pests			Total Healthy
	pink disease	Sun scorch	Thread blight	Others	Horned weevil	Ring/stem borer	Black ant		
Goroka	1	1	-	-	1	-	-	97	
Henganofi	-	1	-	-	-	3	-	96	
Kainantu	2	-	1	-	-	1	1	95	
Lufa	1	1	1	-	-	-	-	97	
Marawaka	-	5	2	-	-	5	-	88	
Okapa	1	1	2	1	-	-	-	95	
PROVINCE	1	1	1	-	-	1	-	96	

(1) Dominant disease or pest.

(iii)

TABLE 3 **COFFEE, ARABICA : MANAGEMENT INDICATORS OF GARDENS, PERCENTAGE**
(Percentage of gardens)

DISTRICT	Clean		Pruned		Fenced		Shade				
	Yes	No	Yes	No	Yes	No	None	Less	Proper	Too much	
Goroka	41	59	21	79	29	71	6	42	38	14	
Henganofi	76	24	37	63	18	82	-	13	56	31	
Kainantu	59	41	30	70	34	66	7	30	43	27	
Lufa	41	59	13	87	20	80	4	37	32	27	
Marawaka	59	41	63	37	58	42	-	63	23	27	
Okapa	53	47	20	80	29	71	3	25	36	36	
PROVINCE	51	49	25	75	27	73	3	33	41	23	

FOOD GARDENS: NUMBER OF HOUSEHOLDS, GARDENS, AREA AND
PERCENTAGE OF GARDENS UNDER DIFFERENT CROPS.

DISTRICT	Goroka	Henganofi	Kainantu	Lufa	Marawaka	Okapa	PROVINCE
Number of Households	17,607	9,193	11,134	6,332	1,624	11,298	57,188
Number of Gardens	25,540	12,684	16,571	6,332	2,195	15,313	78,635
Area of Gardens (Ha)	5,460	2,422	3,513	264	189	3,606	13,454
Crops:							
Aibika.....	19	13	16	32	51	38	24
Banana:							
Cooking.....	33	47	32	86	54	73	48
Mau.....	39	50	43	94	31	72	52
Beans:							
Snake.....	17	5	23	-	8	23	16
Wing.....	26	19	23	64	18	38	29
Cabbage, European...	10	14	21	14	15	12	14
Cassava.....	46	34	21	52	39	31	36
Chillies:							
Lirds eye.....	41	2	3	2	10	-	15
Choka.....	4	5	13	6	1	40	13
Corn:.....	29	41	45	74	68	62	45

DISTRICT	Goroka	Henganofi	Kainantu	Lufa	Marawaka	Okapa	PROVINCE
Ginger.....	23	20	14	36	38	49	27
Kaukau. (Sweet. Potato.)	58	41	67	100	72	87	67
Mami.....	8	12	5	4	6	28	12
Moku.....	30	27	34	70	4	79	42
Nase.....	27	6	26	18	6	49	26
Onion.....	21	10	19	28	54	45	25
Pandanus.....	12	5	10	20	7	15	10
Pawpaw.....	17	4	10	16	8	-	10
Peanut.....	26	14	18	26	15	12	19
Pineapple.....	18	11	10	22	13	10	14
Pitpit.....	44	41	59	98	71	85	60
Pumpkin.....	36	40	35	48	33	62	42
Sugarcane.....	47	53	52	86	71	82	60
Taro:							
KongKong.....	39	20	26	40	28	45	34
Tru.....	38	14	37	64	53	56	40
Tobacco.....	10	2	11	2	40	23	12
Tomato.....	21	6	17	10	11	8	14
Yam.....	16	16	24	56	36	51	28