

Table 5. Estimated average labor utilization for different food crops per operation in Nigeria.

Crop	From literature sources		From field surveys			
	mandays/ha		mandays/ha			
Operation	Maise	Yam	Cas-sava	Up-land rice	Coco-yam	Soy-bean
Land preparation	24	95	40	55	36	35
Planting	10	35	13	30	14	15
Fert. application	15	15		5		12
Weeding	25	70	45	50	38	28
Harvesting	16	60	70	35	60	35
Totals	90	275	168	175	148	125

Agroforestry surveys

An agroforestry field survey was undertaken in southern Nigeria to identify major types of landuse in traditional farming systems and establish the degree of integration between (a) forest and tree crop plantations and small holder tree crop farming and (b) traditional arable crop farming and livestock production systems. Economic woody species, both cultivated and noncultivated, and their association with traditional arable crop farming received particular emphasis during the survey. The 6 survey locations—Ezzamgbo, Umudike, Onne, Ikoma, Akamkpa and Uyo—are in the humid tropical zone, except Ezzamgbo, which is in the transition from the tropical wet to the tropical wet-and-dry climatic zone.

Landuse in traditional farming systems. Both traditional agriculture and rural settlements are largely confined to uplands with bottomlands seldom used for agriculture. All farmers in the survey areas have rain-fed upland farms. Only 23, 13 and 23 percent of the farmers in the derived savanna, lowland forest and coastal lowlands, respectively, have additional farms located in bottomlands. Permanent compound farm plots, common in the central zone of the region and in the settlement sites, are typically located on uplands or well-drained sites. The most common type of settlement is the dispersed homestead type, which is also correlated with the prevalence of permanent compound farms.

Major types of traditional systems of agriculture and

their landuse. The dominant and most widespread types of traditional farming systems are permanent compound farming, rudimentary sedentary agriculture (with or without short fallow periods), bush fallow cultivation and traditional permanent tree crop farming. Shifting cultivation hardly exists, and taungya is hardly used in the region. Livestock is relatively insignificant. The bush fallow cultivation and the rudimentary sedentary agriculture are the most widespread systems of land use. Permanent compound farming is comprised of tree and arable crop farming enterprises with livestock as a third and minor activity. Land allocation is essential for homesteads, and tree and arable crop farming with livestock is confined to homesteads and villages.

Outside the permanent compound farms, except for retained (wild) economic tree crops such as oil palm, planted tree crops and arable crop farming are not spatially integrated. Hence, tree crops, once planted, occupy the land permanently while the arable crops are largely grown in the traditional bush fallow and/or rudimentary sedentary agriculture with a land use factor for uplands

($L = \frac{C+F}{C}$) ranging from 2.5 to 3.6 (Table 6). Thus, outside the permanent compound farms and traditional per-

manent tree crop farms, the land use ratio ($R = \frac{C}{C+F} \times$

100) in eastern Nigeria is less than 34 percent for uplands and 51 percent for bottomlands (Table 6).

In terms of land allocation, planted tree crops (including plantains and bananas) accounted for about 67 percent of the cultivated land; tree and arable crops mixture for 7 percent; and arable crops for only 25 percent (Table 7). About 76 percent of the farmers had arable crop farms under 4 ha, 45 percent of which were under 2 ha. Similarly, about 56 percent of the farmers had tree crop farms under 4 ha. Tree and arable crop mixtures were largely confined to farmers with the smallest amount of cultivated land.

Cultivated areas devoted to the important tree and arable crops grown were assessed for each survey location. Tree and arable crops most frequently grown with considerable acreage, in the order of importance for each group, were (a) oil palm, cocoa, plantain/banana, kola, rubber and citrus and (b) cassava, yam, maize and rice.

Table 6. Small holder land use in eastern Nigeria: Type of land cropped and cropping/fallow duration (1980).

Enterprise/Farmer	Derived Savanna				Lowland Forest				Coastal Lowland			
	Ezzamgbo		Ikoma		Umudike		Akamkpa		Onne		Uyo	
	Up-land Yr.	Bot-land Yr.	Up-land Yr.	Bot-land Yr.	Up-land Yr.	Bot-land Yr.	Up-land Yr.	Bot-land Yr.	Up-land Yr.	Bot-land Yr.	Up-land Yr.	Bot-land Yr.
Cropping year, average	2	1.5	1.8	-	2.20	1	2.10	1	2	1.3	2.15	-
Cropping year, range	1-5	1-8	1-3	-	1-3	1	2-3	1	1-3	2-8	2-3	-
Fallow year, average	3.2	1.3	5	-	4.9	1.25	4.9	1.35	4.9	1.3	4.1	-
Fallow year, range	2-5	1-3	3-7	-	5	6	3-7	1-5	2-7	1-8	2-7	-
Land use factor ($L = \frac{C+F}{C}$)	2.5	1.9	3.6	-	3.25	2.25	3.33	2.35	3.45	2.08	2.9	-
Frequency of upland and bottom lands (% of farmers using)	100	35	100	-	100	5	100	20	100	50	100	5

(See Okigbo and Greenland, 1977 for classification)