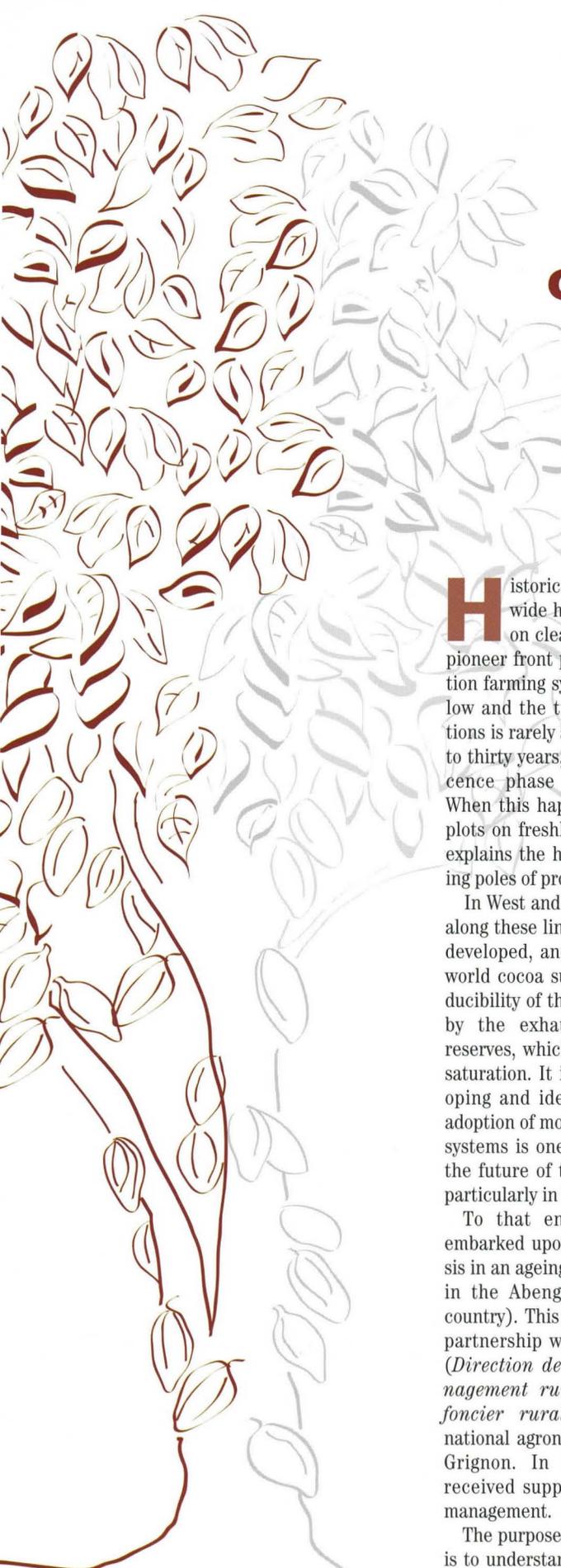


Agricultural diagnosis of a region of former pioneer fronts in Côte d'Ivoire



Historically, cocoa cultivation worldwide has virtually always developed on cleared tropical forest land, in a pioneer front process, with low intensification farming systems. Production levels are low and the transfer of technical innovations is rarely satisfactory. After twenty-five to thirty years, the plantings enter a senescence phase and productivity declines. When this happens, farmers open up new plots on freshly cleared forest land, which explains the historic phenomenon of shifting poles of production.

In West and central Africa, it is precisely along these lines that cocoa cultivation has developed, and nowadays provides 70% of world cocoa supplies. However, the reproducibility of this system is now jeopardized by the exhaustion of available forest reserves, which can sometimes reach land saturation. It is for this reason that developing and identifying conditions for the adoption of more sustainable cocoa growing systems is one of the main challenges for the future of the cocoa commodity chain, particularly in West Africa.

To that end, the Cocoa Programme embarked upon a farming systems diagnosis in an ageing Ivorian cocoa growing zone, in the Abengourou region (East of the country). This operation was conducted in partnership with BNET in Côte d'Ivoire (*Direction de l'agriculture et de l'aménagement rural et Direction du plan foncier rural*) and with the French national agronomy institute (INRA), Paris-Grignon. In the Abengourou zone, it received support from ANADER regional management.

The purpose of such diagnosis operations is to understand how agrosystems function

and identify innovations taking place, be they spontaneous or not.

Main results

This agrarian diagnosis was undertaken in 1999 in the Abengourou region of Côte d'Ivoire, in the Affalikro-Kouakou Ndramanekro sector. It is a zone of former pioneer fronts, and typical of the senescent phase of cocoa cultivation.

The study made it possible to trace the changes that have occurred in the local agrarian situation and identify how producers take up the challenge of post-forestry cocoa cultivation, by applying appropriate technical and organizational innovations.

Changes in the agrarian situation (1900-1999)

At the turn of the century, the farming system was based on slashing and burning, with two years of crops (yam-taro-banana, then groundnut-maize-banana), combined with hunting and forest gathering.

Cocoa cultivation was introduced into the region between 1910 and 1950, and was first adopted by chiefs and eminent members of society. The dominant agrarian system combined food crops and cocoa trees, with cocoa seedlings planted among the food crops. The food crop-tree fallow system was replaced by a succession of forest clearance-food crops-cocoa plantings, a system which meant continuing to extend on cleared forest land.

Up to World War II, plantations were under 10 ha in size and were reserved for eminent members of society. The main limiting factor at the time was the work force. The manpower was primarily family labour,

completed with a few, gradually emancipated slaves. In the 1930s, coffee cultivation developed to the detriment of cocoa, due to its early production and the low price fetched by cocoa.

From the 1950s and up to the 1980s, the system was characterized by the major development of plantations on pioneer fronts with the massive influx of migrant workers: it was a land rush. The system was largely dominated by plantations and food crops played a secondary role. The forest (interfluvial zone) rapidly diminished and farmers began clearing lowlands to plant cocoa, but with mediocre results. At the end of the 1980s, the forest had virtually disappeared, and cocoa replantings were set up in coffee plots and on fallow land left after old plantings had been abandoned. In order to cope with a food shortage, food crops were grown in lowlands, notably by share-croppers (*aboussan*).

Since the 1980s, owners have been replanting cocoa trees in coffee plots after pulling up every other coffee tree. This technique makes it possible to continue planting cocoa, though there is no longer any forest available, and to benefit from labour in a semi-productive young plantation. Indeed, labour is becoming increasingly rare: migrants are now moving to the West and Southwest. At the end of the 1980s, replanting was carried out on fallow left by old plantations, as young people returned to the village, having been unable to find work in town. Food crops have regained a dominant position in the farming systems. Lastly, since 1993, there has been a clear tendency towards farming system diversification, with the development of landless activities, market garden crops, irrigated rice and oil palm.

Current situation

Four types of farming system were identified in the study region (East of Abengourou):

- type 1, which comprises "large farmers". They farm areas of more than 15 ha in the interfluvial areas, mostly occupied by plantations, but also by reserve fallow,
- type 2, which refers to farming systems practised by share-croppers (*aboussan*), and which primarily involves food crops in lowlands,
- type 3, which comprises farming systems practised by the young sons of large farmers, who possess small interfluvial areas (under 6 ha), either planted or left fallow, with free access to lowlands,

- type 4, which comprises farming systems practised by the other farmers who became established later. These growers have smaller areas (interfluvial areas of under 15 ha), with no reserve fallow, and also farm hired land.

The distribution of types within the populations and in space, reveals high inequality within smallholder society (table). Today, 20% of farmers possess 100% of the land, whereas 80% have none (*aboussan*). These share-croppers farm for themselves 10% of the area held by the owners.

The large farmers (type 1) arrived earliest in the zone: they are Agnis descending directly from the founder of the village, on the one hand, and the other Agnis, Barbo-Koulangos, Baoules and the first Burkinese to arrive, on the other hand. The direct descendants of the founder of the village easily had access to the forest and cleared 4 ha per year as soon as the pioneer front period began. They now have farms with cultivated areas of more than 45 ha and sometimes over 100 ha in interfluvial zones. The farming systems comprise fallow areas (around 25% of the area cultivated), cocoa mono-cultures (35%), intercropped coffee and cocoa (13%), immature unproductive plantings (8%) and food crops (2%).

Each year, they use a limited area of fallow for food crops (own consumption) and to plant a mix of cocoa and coffee trees. The cocoa trees are grown either from seedlings reared in the nursery, or beans sown directly in the field (two beans every metre), from pods harvested on site. The coffee seedlings are mostly selected plants distributed by ANADER under the coffee revival project.

The productive plots mainly consist of cocoa monocultures, more rarely a mix of cocoa and coffee. Upkeep in these plots is systematically entrusted to share-croppers. Treatments are regularly carried out against mirids (capsids). Cocoa is harvested in three rounds; with yields from treated plots reaching 500 kg/ha. In the mixed plots, yields are 150 kg/ha for cocoa and 50 kg/ha for coffee.

For the last few years, rubber and oil palm plantings have been developing in the interfluvial zones and lowlands. They currently account for 4% of the total area.

The other Agnis who are not direct descendants of the founder of the village (and the first outsiders) also have large farms, with interfluvial areas of ranging from under 15 ha to 50 ha, notably among the Baoules. They also have access to bottomlands. However, their cocoa cultivation system is less intensive. Their plantings are more regularly treated against mirids.

The sons of large farmers (type 3) farm small interfluvial areas (under 6 ha) and have access to fallow.

The most diversified system consists of young plantings (40%), food crops (10 to 15%), fallow (15 to 40%) and cash crops in the bottomlands, such as market garden crops (under 25%).

Lastly, the farmers who arrived later (type 4) no longer had any fallow available for them, nor access to lowlands. The areas planted to cocoa and coffee amount to under 15 ha. Their farms comprise untreated cocoa plantings (30%), a mix of coffee and cocoa (55%), coffee plantings (10%) in the interfluvial areas and tenant-farmed food crops in bottomlands.

Conclusion: a few lessons from this case study

Three main points are revealed by this study:

- the decisive nature of access to land in the differentiation of the agrosystems,
- a strong tendency towards farming system diversification, especially by the most fortunate farmers in terms of land and capital,
- the existence of numerous attempts to replant old cocoa plantings.

In the study region, the main farming system differentiation factor was and remains access to land, a factor which in turn governs access to labour. Access to land and labour occurred differently depending on when the farmers arrived. For the last ten

Table. Distribution of cultivated areas by type of land owner.

Farming systems	Farms (%)	Area covered (%)
Type 1		
Direct descendants of the village founder	1	25
Large farmers	8	40
Type 3		
Young sons of large farmers	3	10
Type 4		
Other farmers	8	25

years or so, young farmers have been turning to production diversification, obliged to make more use of lowlands, due to land saturation. They are developing crops that are more lucrative per unit area. Diversification through tree crops (oil palm, rubber, cashew) or food crops (irrigated rice) and market garden crops (tomato, okra, aubergine) seems to be a strategy for maximizing income per unit area and minimizing risks by limiting financial dependence on cocoa.

This phenomenon of "no cocoa" diversification may nonetheless be a factor leading to the intensification of cocoa cultivation (pesticide purchases, replanting), particularly among large farmers who reinvest part of their cash resources in input purchases for cocoa. For instance, vegetable sales from May to July provide cash-flow to buy anti-mirid products, and in turn cocoa sales provide funds for fertilizers, seeds and pesticides for market gardening.

Lastly, numerous attempts at cocoa replanting have been seen in the last few years in the region, mainly on fallow or former coffee plantings, much more rarely in old cocoa plantings. However, the study carried out did not reveal how successful these replantings have been, nor did it identify the problems encountered, apart from the observed absence of technical supervision to accompany these replanting or rehabilitation initiatives. ■

List of publications

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