

To Art and Ellie

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I. INTRODUCTION

A. Parastatal Theory and Overview of Paper

The 1970s saw widespread disillusionment with theories advocating massive investment in heavy industry to create a modern industrial sector whose benefits would "trickle down" to the masses. Policy makers shifted the focus of their development programs from industry to agriculture and rural development. The new direction was the result of significant learning from experience and as such was rightly acclaimed. Simultaneously, but virtually unnoticed, a major shift in the institutional structure of developing economies was occurring: while governments gradually nationalized the local subsidiaries of multinational corporations, or transformed them into joint ventures, the number of state corporations multiplied rapidly. By the end of the 1970s, parastatals outweighed the importance of multinationals in almost all developing nations, and throughout West Africa parastatals were implementing key rural and agricultural development programs.

Economists and other social scientists interested in economic development have exhaustively and usefully analyzed both agricultural development and multinational corporations. However, as Gillis (1980) observes, they have

conducted relatively little research on parastatals, especially on parastatal efficiency. As recently as 1978, a World Bank research project unearthed only seven papers on parastatal efficiency, of which six were largely anecdotal accounts that could not be generalized into broad patterns of parastatal success and failure.¹ None of these were specifically devoted to parastatals engaged in agricultural development.² Recently, however, Jones (1975), Marris (1978) and Gillis (1977, 1980) have carried out studies that explore the theory of parastatal efficiency and are designed to facilitate comparison and generalization.³

¹Robin Marris, "The Comparative Efficiency of Public Enterprises--A Survey of the Literature" (Washington, D.C.: World Bank, February 1978), pp. 20, 25.

²Marris, "Comparative Efficiency," overlooks Hans Blume, Organizational Aspects of Agro-Industrial Development Agencies: Nine Case Studies in Africa (Tea, Cotton, Oil-Palm), ITS Afrika Studien no. 58 (Munich: Weltforum Verlag, 1971). Blume ostensibly writes about agro-industry, but since most of Blume's cases are parastatals, his insights are relevant. See also Janice Jiggins, "Regional Alternatives to Ministries of Agriculture: Agricultural Development Projects in Malawi, Nigeria and Ghana," Agricultural Administration, 6:1 (January 1979), pp. 89-97.

³See also: Glen P. Jenkins, "Performance Evaluation and Public Sector Enterprises," Development Discussion Paper no. 46 (Cambridge, Mass.: Harvard Institute for International Development, November 1978); idem, "An Operational Approach to the Performance of Public Sector Enterprises," Development Discussion Paper no. 47 (Cambridge, Mass.: Harvard Institute for International Development, November 1978); Donald P. Warwick, "A Transactional Approach to the Public Enterprise," Paper presented at the Second B.A.P.E.G. Conference (1980).

This paper expands the economic theory of parastatal efficiency to explicitly incorporate organizational factors. Previous studies have concentrated on the macro level of the national economy (allocative efficiency) and/or the micro level of the individual (Leibenstein's (1966, 1976) concept of "x-efficiency"), and have neglected the intermediate level of the organization.¹ Micro, macro, and intermediate level theories generate hypotheses about factors affecting the success of parastatals implementing rural and agricultural programs. Utilizing an open system model of agricultural parastatals' functioning, the paper develops a set of performance indicators to test the validity of the hypotheses.

The Ivory Coast is a particularly illuminating case study for two reasons. First, unlike the vast majority of developing nations, the Ivory Coast expanded its agricultural sector with huge success. Agriculture continues to provide the impetus behind a long term rate of growth described by the World Bank (1978:3) as "unique on the African continent." Eliciting the causes of the Ivory Coast's remarkable results in agriculture offers valuable guidelines for other, less successful nations. Second, the Ivory Coast has relied heavily on parastatals to implement agricultural development. In 1980,

¹Organizational problems constitute the chief subject matter of the anecdotal business administration and public administration studies. They have begun to be conceptualized with some rigor (notably Warwick, "Transactional Approach"), but economists have not systematically analyzed them.

close to three dozen parastatals were engaged in all aspects of agricultural and agro-industrial development, dwarfing the direct activities of the Ivorian Ministry of Agriculture.

Three parastatals will be studied in depth: SODEPALM, the CIDT, and SATMACI.¹ All are important, and together they represent a broad spectrum of parastatal forms, ranging from a joint venture (the CIDT) to an agency that has always been fully public (SATMACI). The case study forms the basis for generalizations about the relative efficiency of different parastatals. The paper concludes by offering policy recommendations to USAID in order that it can assist developing nations in promoting the efficiency of their parastatals and in rationally deciding when to use parastatals for implementing programs of agricultural development.

B. Definition of Parastatal

There is no general agreement on the exact definition of the parastatal organizational form. Gillis (1980) for example, requires that parastatals' output be marketed, at least to some extent, but is mute on the issue of whether or not the organization must be visibly autonomous from the central government. By contrast, Parot (1976) holds a legal

¹See Appendix I "List of Acronyms" for these and all future acronyms in the text.

perspective that requires legal autonomy for an organization to qualify as a parastatal, and disregards issues of marketed output.

Both of these definitions are covered by two dimensions that usefully delineate parastatals: independence from the central government, and "marketedness" of output. Parastatals occupy the dimensions' midrange, with the central government and the private sector occupying the extremes.¹

FIGURE 1
CLASSIFICATION OF PARASTATALS

Marketedness of Output	Independence from Government	
	High	Low
High	private sector	state commercial enterprises
Low	autonomous public agencies	central government

Jones' (1975) elegant analysis breaks the "independence" dimension into three aspects: government ownership (O), government control of the organization's internal decisions (C),

¹The diagram below is similar to that of Leroy P. Jones, Public Enterprise and Economic Development: The Korean Case (Seoul: Korea Development Institute, 1975), p. 20.

and the organization's visible autonomy in the sense of possessing its own budget and juridical personality (A). Control and autonomy are overlapping concepts, but are not identical. A visibly autonomous (A) organization might make internal decisions without government interference (\bar{C}), or it might receive constant official directives from the minister overseeing it (C).¹ Ownership (O) refers to the government's direct and indirect share of equity.

The second dimension is labelled "marketedness" referring to the fact that pure private goods are sold in a market (M) whereas pure public goods are not sold and cannot be marketed (\bar{M}). Jones (1975:25) classifies the entire spectrum of productive entities along these two dimensions, and then (1975:25) uses the four criteria (O,C,A,M) to define public enterprise as follows:

A broad definition of public enterprise incorporates one of each pair of defining elements, while a narrow definition requires that both criteria of each pair be met. Thus, a public enterprise may be broadly defined as a producer of goods or services where: (a) ownership and/or internal control are held by the government; and, (b) which is autonomous and/or markets its output. A narrow definition would require ownership and control and autonomy and marketed output.

More succinctly:

Broad Definition: $(O \cup C) \cap (A \cup M)$

¹Set theory shorthand is as follows:
 = Intersection: $A \cap B$ contains elements which are common to both A & B.
 U = Union: $A \cup B$ contains all elements of A and all elements of B.
 \bar{A} = Negation: \bar{A} contains all elements of the universal set which are not in A. Thus $(A \cup B) \cap (\bar{A} \cap \bar{B})$ implies A or B but not both.

c.f. Jones, Korean Case, p. 24, footnote 1

Narrow Definition: $(O \cap C) \cap (A \cap M)$

Basic Economic Definition: $(O \cup C) \cap (M)$

Basic Administrative Definition: $(O \cup C) \cap (A)$

The last two formulations represent intermediate specifications which might reasonably be used by individuals with a particular analytic purpose. Someone interested in legal and administrative aspects might wish to examine the tool regardless of the ends being pursued, and thus be concerned only with autonomous enterprises whatever the nature of output. On the other hand, one interested in business management or economics might properly be concerned with marketed output, regardless of the degree of autonomy.¹

Jones selects the Basic Economic Definition. This paper investigates both economic and administrative analyses of parastatals, and hence uses the Broad Definition.

C. Importance of the Parastatal Sector

A sample of statistics will show the profound role that parastatals have assumed throughout the developing nations of Latin America, Asia, and Africa. The data is scant and disparate, but nevertheless indicates how pervasive parastatals have become.²

¹Jones, Korean Case, p. 26.

²Most of the following statistics are drawn from Malcolm Gillis, "The Role of State Enterprises in Economic Development," Development Discussion Paper no. 83 (Cambridge, Mass.: Harvard Institute for International Development, February 1980), pp. 6-10. The rest come from John B. Sheahan, "Public Enterprise in Developing Countries," in W.G. Shepherd, ed., Public Enterprise: Economic Analysis of Theory and Practice (Lexington, Mass.: Lexington Books, 1976); Republic of the Ivory Coast, Banque de Données Financières, Centrale de Bilans 1978 (Abidjan: Ministry of Economy, Finance, and Planning, 1979) and Jones, Korean Case.

In Latin America, Chilean parastatals contribute roughly twenty percent of gross domestic product. Bolivian parastatals account for roughly forty percent of GDP and for more than seventy-five percent of gross industrial investment. Figures for parastatals' share of gross industrial investment in Brazil vary between twenty-five and forty-four percent; for Mexico their share exceeds seventy-five percent.

In Asia, parastatals account for about seventeen percent of industrial value added in Korea, twenty percent in India, thirty-three percent in Nepal and Sri Lanka, and sixty percent in Bangladesh. In 1972, parastatals in Bangladesh held eighty-five percent of all modern industrial assets. In terms of gross non-agricultural investment, parastatals account for roughly thirty percent in Taiwan and Korea, close to fifty percent in India, and over seventy-five percent in Bangladesh.

In Africa, Egyptian parastatals generate more than seventy-five percent of industrial value added. The number of Tanzanian parastatals has doubled since 1964. Looking at West Africa, Ghanaian parastatals contribute twenty-five percent of GDP. Since 1962, the number of parastatals in Senegal has tripled, reaching (in September 1980) twenty-seven fully state-owned parastatals and seventy-five quasi-public corporations, with a total of twenty-five thousand employees.¹ Mali had

¹Pranay B. Gupte, "Senegal, Once France's Star Colony, Sees Glory Dim," New York Times, 17 September 1980, p. A2.

twenty-eight fully state-owned parastatals in 1969 which comprised the bulk of the nation's modern sector, employing three-quarters of the total modern sector workforce.¹ In 1974 they accounted for sixty percent of turnover in the modern industrial sector.

In spite of the Ivory Coast's liberal capitalist ideology, eight of the nation's ten largest corporations in 1978 (measured in terms of value-added) were parastatals. An unofficial survey by the Ivorian government in May 1980 listed twenty-eight completely public corporations, fifty-three fully public "establishments," fifty-six quasi-public corporations in which the state directly or indirectly holds a majority of equity, thirty-eight quasi-public corporations in which the state holds one-third to one-half of corporate equity, and many more where the state holds less than one-third of corporate equity. A cursory examination of the parastatal sectors in West African nations spanning the ideological spectrum from radical socialism (Mali) through humanistic socialism (Senegal) to liberal capitalism (the Ivory Coast) reveals that parastatals are a significant part of the economy in each case. The origin of parastatals is therefore not ideology--they represent, instead, a pragmatic solution to economic and social problems common to

¹F. Constantin and C. Coulon, "Enterprises publiques et changement politique au Mali," in F. Constantin et al., Les Entreprises Publiques en Afrique Noire, vol. 1: Sénégal, Mali, Madagascar, Série Afrique Noire no. 9, ed. Dmitri-Georges Lavroff (Paris: Editions A. Pedone, 1979) pp. 129-195.

most developing nations.¹

Parastatals play an important role in agricultural development throughout West Africa. Nigeria uses parastatals to deliver a package of services (inputs, extension, marketing, credit) in the Northern States. Ghana set up huge state farms under N'krumah (which were a well publicized fiasco) and recently (1978) established a highly autonomous parastatal--URADEP--to implement an integrated program of rural development in Northern Ghana. Inside this region, URADEP has taken over almost all activities and even some personnel of the Ministry of Agriculture.² Interestingly, URADEP has no plans to merge with the Ministry of Agriculture. Instead, some policymakers hope to duplicate URADEP's operations elsewhere in Ghana, ultimately reducing the Ministry of Agriculture to a coordinating agency.

Senegal has relied heavily upon agricultural parastatals since Independence in 1960. Currently, the National Office of Cooperation and Assistance for Development (ONCAD) provides both agricultural extension services and marketing channels. Where intensive extension services are needed, more

¹See Michael Gaud, "The Public and Cooperative Sector in Middle Africa," Annals of Public and Cooperative Economy, 39:3 (1968), pp. 409-433, and Dmitri-Georges Lavroff, "Avant-propos," in Constantin et al., Entreprises Publiques, pp. v-ix

²For detailed descriptions of URADEP and the Nigerian Agricultural Development Projects see Janice Jiggins, "Regional Alternatives."

specialized parastatals are available. A trio of parastatals each provide an integrated package of services to a particular region, and several parastatals are engaged in agro-industrial projects that include crop production. Provision of credit and construction of irrigation works are also each implemented by a parastatal.

Parastatals undertake the lion's share of development in the Ivorian agricultural sector. Fifteen parastatals directly implement rural development programs. Another dozen carry out research and training, and a further ten provide financial services or engage in agro-industry.

D. Problems of the Parastatal Sector

Although important economically, fully state-owned parastatals have been remarkably unsuccessful financially. Diabaté (1977:36) found that eighteen out of twenty-three Malian state corporations had operating losses in 1974. Constantin and Coulon (1979:166) conclude an extensive survey of Malian parastatals with a succinct critique:

Malian state corporations are unanimous in one respect, at least: they all malfunction. This unanimity is even more remarkable in that it has endured over time. Despite his concern for these institutions, in which he saw the foundation of a new socialist society, the weaknesses Modibo Keita denounced were once again denounced by his successors.¹

¹Translated by the author.

Figures for Senegal are not fully reliable, but strongly indicate a general pattern of unprofitability. A government commission calculated that, overall, fully state-owned parastatals made no profit whatsoever during 1975 to 1976. The forty-three quasi-public corporations in the report had overall negative rates of return on capital during the same period (-3.5% in 1975; -14.6% in 1976).¹ This sorry state of affairs came to a head recently when Senegal very nearly defaulted on foreign debts totally 1.3 billion dollars. A 105 million dollar French aid package and 300 million dollars worth of International Monetary Fund Special Drawing Rights staved off immediate insolvency. In return, the Senegalese government was forced to agree to liquidate some of its most unprofitable parastatals.²

Ivorian parastatals have not performed brilliantly, but compared to Senegal and Mali they have been fairly successful. In 1974, two-thirds of fully state-owned parastatals at least broke even. The previous year only fifty-five percent were self-financing, but this was still better than Mali's low forty-four percent.³

¹Jean-Claude Gautron and Bernard Zuber, "Les entreprises publiques et semi-publiques de Sénégal," in F. Constantin et al., Les Entreprises Publiques en Afrique Noire, vol. 1 Sénégal, Mali, Madagascar Série Afrique Noire no. 9, ed. Dmitri-Georges Lavroff (Paris: Editions A. Pedone, 1979), pp. 1-25.

²See Gupte, "Senegal."

³Calculated from Diabaté, "Examen," p. 36.

The results of poor financial performance, ambitious objectives, plus a (sometimes implicit) government guarantee of repayment has been a massive increase in parastatal borrowing. In the Ivory Coast, the level of foreign borrowing by fully state-owned corporations more than doubled each year during the period between 1974 and 1977, starting from a base of seven billion CFA in 1974. The debt reached such massive proportions (estimates for 1977 run as high as 168 billion CFA) that the government finally banned further independent borrowing by parastatals.¹ Gillis (1980:10-11) calculates that borrowing by parastatals in developing countries rose by 350 percent from 1975 to 1978. This constituted one-eighth of all international borrowing and almost one-third of all commercial borrowing by developing nations. He estimates that new Eurocurrency borrowing by parastatals may have reached 18.5 billion dollars in 1978 alone.

Parastatals' performance has been lacking in more respects than simple financial difficulties. In spite of cost overruns, hectareage and production targets are frequently not achieved, and often the rural social changes produced by the parastatal are far from the desired ameliorations outlined in official government statements. A disproportionate share of project

¹The figures are from the U.S. Department of State, "Ivory Coast Government Budget" (Abidjan: American Embassy, 3 May 1976), p. 7.

benefits often accrues to the rural elite; large irrigation schemes may cast the parastatal as policeman for a recalcitrant and indebted peasantry; and even cooperatives frequently have a negative overall impact, as the following angry passage well illustrates:

These initiatives are normally called 'co-operatives,' but West Africans know what they are-- a source of employment for government workers, a nexus of indebtedness to rival the Lebanese storekeeper, a transfer of part of their labor to the state, a monopoly distributor who sells dear and buys cheap, a political payoff to the government's supporters and a general agent of the state in the local community of farmers.¹

On the other hand, there are cases of success. Hundreds of thousands of smallholders cultivate coffee and cocoa in the Ivorian forest zone, resulting in a massive and widely distributed infusion of capital to rural areas. Cash revenue in the Ivorian savannah has climbed significantly due to cotton growing; villages along the coast have augmented their monetary income through oil palm and coconut production. To varying degrees, parastatals effected each of these sought-for changes.

Now one of the premier organizational tools for the governments of developing nations, parastatals are responsible

¹Keith Hart, "The Development of Commercial Agriculture in West Africa," Discussion paper prepared for the United States Agency for International Development (Abidjan, Ivory Coast: USAID/REDSO, October 1979), p. 156.

for implementing key policies throughout West Africa. They constitute a significant sector of most developing economies and their financial woes affect the entire international banking system. Greater understanding of parastatal success and failure has, therefore, widespread utility.

II. PARASTATAL EFFICIENCY: ALLOCATIVE

EFFICIENCY AND CORRECTIVE SUBSIDY

The magnitude of the parastatal sector and the problems in its operation have sparked an intense search for methods of evaluating and improving parastatal performance.¹ To evaluate or to improve their performance requires a norm of efficiency against which performance can be evaluated and towards which performance can be improved. Economics currently offers two complementary theories of efficiency.² The first (allocative efficiency) investigates: (a) the price incentives which affect parastatals' use of inputs and choice of outputs, and (b) parastatals' goals and the actual impact of their activity in terms of national resource allocation. The second

¹Research is underway at several institutions, notably at the United Nations Department of Economic and Social Affairs, the Commonwealth Secretariat, and by Gillis, Jenkins, and Warwick at the Harvard Institute for International Development. A number of other authors, especially Marris, have made contributions.

²For a brief but interesting discussion of non-economic conceptualizations of efficiency, see Malcolm Gillis, "Efficiency in State Enterprises: Selected Cases in Mining from Asia and Latin America," Development Discussion Paper no. 27 (Cambridge, Mass.: Harvard Institute for International Development, 1977), pp. 3-4.

(x-efficiency) takes resource allocation as given and determines the extent to which the resources are being utilized as effectively as possible.

The Paretian concept of allocative efficiency is the keystone of modern welfare economics. By rigorously defining a situation in which society attains the highest possible level of welfare, it provides the normative basis for classical and neoclassical economists' critiques and recommendations.

Allocative efficiency requires that goods be priced at their marginal social opportunity cost (MSOC). If goods are not priced at their MSOCs, positive or negative subsidies that change the goods' market prices to their MSOCs improve national welfare. There are three kinds of subsidies. A government can: (1) make an outright gift or exact a tax in cash or kind; (2) permit or deny access to subsidized resources (e.g., cheap capital and capital goods, government services, and the like); and (3) enforce an enterprise's monopoly or monopsony position, or conversely undermine an enterprise's control of the market by imposing a low quota or encouraging competition.

The requirement that price equals marginal social opportunity cost is commonly violated by goods whose prices are distorted away from their opportunity costs, monopoly goods, goods with externalities, and public goods. The first case is endemic in the tightly controlled economies of developing countries. If distorted prices cannot be altered, a subsidy can provide partial compensation, thereby improving the

efficiency of resource allocation and raising social welfare.

A common candidate for this variety of subsidy is an exporter in a country that overvalues its currency, as most West African nations have historically done. Overvaluing domestic currency subsidizes imports (which must then be rationed) and taxes exports (which then dwindle). To offset this disincentive to export, governments offer exporters a subsidy usually based on the volume or value of their exports. The correct level of subsidy attracts to the export sector almost exactly the allocation of resources it would have had under free exchange rates.¹

In a free market, monopolists under-produce and over-price their goods in order to maximize their profits. Governments, therefore, usually negotiate production levels and regulate prices directly, using cost-plus-return-to-capital schemes. Pushing production up and prices down to a level where the monopolist's marginal cost equals price augments consumer surplus, and also raises the allocation of productive resources in the monopolist's sector to a more desirable (i.e., efficient) level. Infrastructural monopolies by contrast, often earn very low or negative rates of profit because they supply infrastructures on the grounds of social welfare, not profit

¹Of course, the economically preferable solution is to eliminate the over-valued exchange rate, since export subsidies do not correct other distortions stemming from overvalued domestic currency, notably the import subsidy and ensuing rationing. Furthermore, subsidies entail administrative costs.

maximization. Rural water and electrification programs are good examples. These monopolies merit subsidies, however, not because they are monopolies but because their output has significant externalities (e.g., improved living conditions which attract new industry and slow the exode rural), and public aspects (e.g., improving regional equity).

Externalities are social costs and benefits excluded from the private price of a good. They can arise from both production and consumption of goods. Subsidies that change the private price to the full social opportunity cost increase the efficiency with which the good is allocated. Thus, external effects goods are classic targets of government subsidy. Example of production externalities abound. Pollution is a well-publicized negative externality of industry; rural roads are a common positive externality of logging operations. Pollution should be negatively subsidized, rural roads should qualify for a positive subsidy.

Consumption externalities can be partitioned into three types: private, public, and disequilibrium. A private consumption externality describes the situation when a government decides that most citizens do not rationally value consumer goods. For instance, the negative merits of alcohol and cigarettes often prompt a negative subsidy, whereas purchase of a private home receives a positive subsidy.

Goods with public consumption externalities are those

whose private consumption immediately affects others. If one's neighbor hires a watchman, one benefits from the increased surveillance. A farmer's effective use of pesticides on his own fields reduces the insect population on his neighbors' farms. Both of these goods are worthy of some positive subsidy from the recipients of the positive externality.

Goods whose consumption immediately affects only the consumer, but will in the long term affect society as a whole, have disequilibrium consumption externalities. Common cases in developing countries are staple foods and basic education. Those who consume these goods ultimately increase their own productivity and hence raise the overall welfare of their community, making this a case for positive subsidy.

Pure public goods cannot be marketed: their consumption is not rival and permits no exclusion. The U.S. Army, for example, will not defend you less because it also defends your neighbor (i.e., no rival consumption). Moreover, it is impossible for it to defend your neighbor and not simultaneously defend you (i.e., no exclusion of consumption possible). Being completely unmarketable outputs, the price of public goods is effectively zero. Hence, pure public goods merit a subsidy that equals their full marginal social opportunity cost.

Many parastatals produce goods with public aspects. Because these aspects are amorphous qualities (e.g., prestige, social

equity, law and order, political stability, and the like), identifying the level of "public-ness" is not a straightforward exercise. For example, a modern state textile mill in the interior of a developing country could be considered a pure business investment worthy of no subsidy. However, if considered to be part of a national policy of channeling resources to backward regions, or to poverty-stricken sectors of the populace, the mill qualifies for a subsidy. Evaluating whether a parastatal merits subsidy therefore involves seeking out explicit social welfare goals.¹

Goods with positive externalities and public aspects increase social welfare, which motivates government intervention to encourage their production. The chief social welfare motives for a state to intervene can be analyzed as three independent categories: economic, political, and social.

Economic motives include stimulating overall economic growth or recovery, and stimulating particular priority sectors of the economy which have attracted insufficient private capital or none at all. Economic growth can be stimulated by projects as diverse as a bridge (which has public good aspects) or a school lunch program (which has positive disequilibrium externalities).

¹As far as possible, this paper will exclude implicit social welfare goals, since a creative scholar can justify almost any subsidy on grounds such as "national prestige."

The key political motive is obtaining the control needed to direct the economy according to a plan that promotes maximum social welfare. For the government to control the economy means controlling major concentrations of capital. The classic manifestation of this motive is nationalization of the local assets of a multi-national corporation. However, some countries (e.g., Mali) also nationalize domestic private corporations, and most are unwilling to tolerate much independence from their own parastatals.

A second important political motive is political survival. Controlling potential unrest by doling out government largesse is a widespread practice, but since political survival is rarely explicitly invoked as a motive for establishing a parastatal, the phenomenon falls largely outside this analysis.

Social welfare motives are generally oriented towards improving the lot of a particular region or sector of the population. In the sense that national prestige raises citizens' contentment, it too is a social motive.

It is well known that parastatals are usually established for a variety of these goals. SODEPALM, for instance, was established to stimulate a particular sector of the economy (palm products), benefit a particular region (southern Ivory Coast), and population (smallholders). The SODEPALM Group's later transformation into two separate entities--SODEPALM and PALMINDUSTRIE--on the other hand, was motivated at least in part by the government's desire to control the commanding heights

of its own parastatal sector.

This analysis has specified four kinds of goods which qualify for varying levels of subsidy, and has identified three kinds of administrative motives which introduce public and externality aspects to goods which otherwise might be considered purely private. Subsidies that remedy allocative inefficiencies raise overall social welfare, but subsidizing poorly functioning enterprises reduces overall welfare by wasting resources that could be better employed elsewhere. Therefore, the next step is to investigate the production of the four kinds of goods, particularly the circumstances under which production is efficient.

III. PARASTATAL X-EFFICIENCY

The economic theory of operational efficiency was developed by Leibenstein (1966, 1976) who calls it "x-efficiency," which he defines as the maximum production of goods from a given set of inputs. X-inefficiency is the gap between optimal and actual production.¹ Leibenstein finds three chief causes of x-inefficiency at the level of the individual: non-maximizing behavior, goals that differ from organization-wide goals, and lack of motivation which implies lack of effort.² This paper expands the causes of x-efficiency to include organization-level factors: goals, resources, decision-making, and task environment. The guideline x-efficiency provides for subsidies is clear: to the extent that both individual and organization levels of a parastatal are structured x-inefficiently, the organization's requests for subsidy should be rejected.

¹Defining optimal production entails problematic assumptions on motivation and technical knowledge that x-efficiency highlights. See Marris, "Comparative Efficiency," p. 12.

²Although he distinguishes his work from the 'Carnegie School' theorists, Leibenstein's theories bear similarities to Herbert Simon, Administrative Behavior (New York: The Macmillan Co., 1945); idem, "On the Concept of Organizational Goal," Administrative Science Quarterly (1964): pp. 1-22; and the work of Richard M. Cyert and James G. March, A Behavioral Theory of the Firm (Englewood Cliffs, New Jersey: Prentice-Hall, 1963).

The search for factors contributing to parastatal x-efficiency can be most fruitfully carried out using three models of parastatals' organizational structure and operations. Initially, parastatals will be analyzed as unitary organizations maximizing their goals and resources in an environment of similar actors dominated by a single essentially unitary actor: the central government. Then they will be conceptualized as coalitions of participants in an environment composed of a diverse set of other coalitions. From this perspective, their relations with the government can be analyzed with considerable sophistication. Next, the discussion turns to an explanation of parastatals' task environments and the appropriateness of the parastatal organizational form for a particular set of task environments. Smallholders are generally the key factor in the task environment, and they are discussed at length.

A. Parastatals as Unitary Organizations

Conceptualizing a parastatal as a unitary actor highlights the organizations's goals, resources, and transactions with its environment, especially its environmental dependencies. All organizations have a set of goals which range from clear and measurable to vague, from complementary to incompatible, from operational to impossible, and from one to many. The set of goals with the potential to generate the highest level of organizational x-efficiency is a single, clear, measurable and

operational goal. Parastatals' goal-sets rarely approximate this ideal. Vague public welfare goals often conflict with specific profitability and output targets, with no guidelines for ranking or weighting conflicting goals.¹ Clearly, one source of possible parastatal x-inefficiency is the goal-set.

Organizations have a number of resources, some of which they control more fully than others. Listed briefly, the most important resources are:

1. Political power.
2. Funds for recurrent and investment budgets.
3. Manpower (skilled and unskilled).
4. Expertise.²
5. A firmly established and recognized mission or domain.³
6. Firmly established organizational rules and operating procedures.⁴

¹The only concrete attempt to tackle this issue is A. Soyode, "A Framework for the Evaluation of Performance in Public Corporations," The Quarterly Journal of Administration. For a poignant description of the difficulty conflicting goals pose for parastatal managers, see Warwick, "Transactional Approach."

²"Expertise" confers legitimacy on technical organizations.

³See S. Levine and P.E. White, "Exchange as a Conceptual Framework for the Study of Interorganizational Relationships," in Amitai Etzioni, ed., A Sociological Reader on Complex Organizations (New York: Holt, Rinehart and Winston, 1961), pp. 117-122.

⁴See Arthur L. Stinchcombe, Constructing Social Theories (New York: Harcourt, Brace, and World, Inc., 1968).

Organizations use their resources both to achieve goals and to augment their resources (means) for achieving goals.¹ For instance, an agricultural parastatal uses political power and the mystique of expertise less to directly attain agricultural development goals than to obtain the key operational resources of funds and manpower needed to achieve these goals.

The greater the control an organization exerts over its resources, the greater its potential efficiency. Without control over resources, a key resource may suddenly become unavailable, thereby causing a bottleneck that leaves other resources idle. Thus, the degree to which a parastatal maintains assured access to critical resources has an important impact on its x-efficiency.

The key problematic resource for parastatals is funding. Because many parastatals produce goods with externalities or public aspects that merit subsidy, they must rely on the central governments for funds. Unfortunately, central governments of developing countries rarely disburse funds expeditiously and often fail to disburse the full sum allotted.² Unreliable financing vitiates long term financial planning, and severely

¹See Simon, "Organizational Goal."

²See Naomi Caiden and Aaron Wildavsky, Planning and Budgeting in Poor Countries (New York: John Wiley and Sons, 1974).

complicates management of day-to-day cash flow.

Three other resources are especially problematic for parastatals: manpower, a firmly established mission, and firmly established rules and procedures. Manpower problems result when governments force incompetent personnel or improper personnel codes upon parastatals. Incompetent personnel are usually either bureaucrats entering political exile, political allies receiving employment as political pay-off, or friends and relatives of important personages. Improper personnel codes tend to resemble civil service codes, rather than private sector personnel codes incorporating greater risk and remuneration.¹

Because the government's goals change, the mission assigned to a parastatal may change drastically and abruptly. For instance, crop oriented parastatals can become responsible for the integrated rural development of a region. Although some change in mission is adaptive, drastic alteration can disrupt the organization's operation.

Some change in an organization's structure, rules, and procedures usually represents healthy adaptation to changing circumstances. However, every change entails the cost of

¹A particularly unfortunate hybrid is a code that lacks the security of civil service employment but has the same salary ceilings. When the Ivorian government attempted to implement a code of this type in 1972, the parastatals reacted so negatively that the code was never actually enforced.

administrative confusion until the new routines are established. Major changes cause major confusion. When a government frequently restructures a parastatal, the parastatal's organizational x-efficiency is likely to be seriously impaired.

Organizations are not passive. To ensure the availability of resources, they follow a number of strategies: search for alternative sources; and/or attempt to gain power over suppliers, coopting them, contracting with them, and coalescing with them. If these strategies are fruitless, an organization can build buffer stocks, but the pattern that emerges is clear: to the extent that a parastatal relinquishes to the government control of key resources, the parastatal will not function well in terms of x-efficiency.

B. Parastatals as Coalitions

Conceptualizing a parastatal as a coalition of participants in an environment composed of other coalitions focuses attention on three issues: (1) information flow and decision-making, (2) the quality and motivation of decisionmakers and other staff providing information and implementing decisions, and (3) interactions that individuals and coalitions inside the parastatal have with individuals and coalitions in the environment.

Government participation has a tremendous impact on parastatal information flow and decisionmaking. Much of the

effect is pernicious, but government participation has the potential to greatly contribute towards parastatal x-efficiency.

The shorter an organization's chain of command, the more rapidly and clearly information flows through the system. The time required for a decision increases arithmetically with the number of decisionmakers involved. The probability that the message will be transmitted accurately or that any new policy will be adopted declines geometrically.¹ When the chain of command becomes lengthy and complex, organizational paralysis sets in.

The more decisions are insulated from the wider arena of governmental decisionmaking, the more likely they are to be rational and synoptic. Decisions made by the central government are political resultants of complex bargaining over a wide range of issues, some of which are only peripherally related to a particular decision confronting a particular parastatal.²

¹Jeffrey L. Pressman and Aaron Wildavsky, Implementation (Berkeley: University of California Press, 1973), point out that if two decisionmakers each are more than likely (probability = 0.70) to agree to a policy, the likelihood they will both agree is less than 50 percent.

²See Graham Allison, Essence of Decision (Boston: Little, Brown and Co., 1971); Morton Halperin and Arnold Kanter, eds., Readings in American Foreign Policy: A Bureaucratic Perspective (Boston: Little, Brown and Co., 1973); and Morton Halperin, Bureaucratic Politics and Foreign Policy (Washington, D.C.: Brookings Institution, 1974).

Autonomous parastatals can include commercial considerations in their decisionmaking, and those with partners from the private sector can tap their technical expertise. In general terms, governments control parastatal decisionmaking in three ways. The first entails significant government involvement in operational decisionmaking, and the second has the potential for significant informal government involvement. By contrast, the third method minimizes interference in day-to-day decisionmaking.

1. The government can control the decision directly.

The Minister(s) in charge of a parastatal can:

- a. formally or informally tell the director and board what to do;
- b. appoint a representative with the right to investigate and observe all major corporate decisions, and the power to suspend or veto improper decisions; and
- c. require that certain corporate decisions (usually financial) be ratified by the overseeing Ministry.

2. The government can control who makes the decision:

- a. The Minister(s) in charge of a parastatal can appoint the board of directors, the chairman of the board, the managing director of the corporation, and even key subordinate posts (e.g., assistant managing director, treasurer).

3. The government can control the decision indirectly by controlling the criteria of "proper" or "good" decisions.

The Minister(s) or ministerial representatives can:

- a. institute periodic audits of corporate accounts; and
- b. periodically conduct performance evaluations of the corporation.

The tightness of government control depends on several factors: the physical, legal, and budgetary autonomy of a parastatal; and the percentage of parastatal equity the government owns directly or indirectly. The Ivorian government includes in state ownership both direct government investment (usually financed by the BSIE) and holdings of one hundred percent public organizations.¹

Since 1975, Ivorian law has distinguished only three degrees of public ownership: any percentage at all, at least thirty-three-and-one-third percent, and one hundred percent. As the government's share of equity rises past these thresholds, legal government involvement in the corporation's operational decisions increases.

Physical proximity to the central government multiplies the opportunities for the government to get informally involved

¹Including indirect holdings prevents state corporations from establishing subsidiaries that escape from government control. See Hugues Tay, "Le nouveau statut des entreprises publiques en Côte d'Ivoire," Revue Ivoirienne de Droit, 4 (1971).

in a parastatal's operational decisionmaking. In the Ivory Coast, most agricultural parastatals have headquarters in the capital--Abidjan--and are likely to be quite vulnerable to this kind of involvement. By contrast, the CIDT is somewhat insulated from this, since its headquarters are in the interior and often out of touch by both telephone and telex.

Parastatals with the legal autonomy of a juridical charter that cannot be changed by the central government without prior consultation and agreement of other equity holders and chief creditors, can use this to help resist informal government influence. Moderately autonomous parastatals have clear and independent charters, but the government can easily revoke or transform them. Organizations with no independent juridical existence tend to be subject to considerable government interference.

Budgetary autonomy is a prerequisite of independence from the government. Without a separate budget, a parastatal is so closely tied to its parent ministry that it is probably more accurate to describe the organization not as a parastatal but as a department of the ministry.

This previous section discusses several reasons to exclude the government from parastatal decisionmaking on the grounds of maximizing efficiency. However, for maximum efficiency the government should participate in parastatal decisionmaking in two ways. First, a parastatal's broad policy decisions should

be allocatively efficient. The government is the obvious organization to ensure that the overall thrust of a parastatal's policy conforms to national priorities.

Second, the government should control the broad criteria of decisionmaking by setting rigorous performance standards for conduct, profit, and output. Organizations with excess resources, or "slack," use them to avoid the unpleasant requirements of minimizing cost, such as cutting perquisites, dismissing incompetent employees, and forcing departments pursuing conflicting goals to reach a compromise.¹ For example, an organization with financial slack can permit its engineers the pleasure of choosing sophisticated modern equipment for a new factory, whereas a poorer organization might force the engineers to compromise with their purchasing and finance departments and obtain less elegant but more profitable machinery. Organizations that are not forced by either market or government to meet rigorous standards tend to allow their costs to rise or their service to deteriorate, which are basically equivalent.²

¹See Cyert and March, Behavioral Theory.

²For empirical evidence, see Harvey Leibenstein, "Allocative Efficiency and X-Efficiency," American Economic Review, 56:3 (June 1966); and Walter J. Primeaux, "An Assessment of X-Efficiency Gained Through Competition," Review of Economics and Statistics, 59:1 (February 1977), pp. 105-108. More evidence and a different perspective are in Albert O. Hirschman, Exit, Voice and Loyalty (Cambridge, Mass.: Harvard University Press, 1970).

Parastatal efficiency is especially dependent on rigorous government performance standards because parastatals are protected against the ultimate market sanctions: liquidation for the organization, and unemployment for its members. Parastatals can almost invariably count upon their governments to bail them out of dire financial straits. If parastatal personnel are civil servants, liquidation of their parastatal simply means transfer to a new department of the government. Thus, periodic financial audits and performance evaluations play a key role in maintaining parastatal x-efficiency in the absence of market sanctions.

Formal personnel codes exercise a dual impact on x-efficiency. Since parastatals frequently offer their employees greater remuneration, perquisites, promotion opportunities, and responsibility than the central government can, the caliber of parastatal staff often exceeds that of civil servants. Moreover, to the extent parastatals can freely reward success and punish failure, their employees are more highly motivated than civil servants. Civil service personnel codes often automatically promote all employees who have not violated a regulation or committed a flagrant mistake. Inertia and rigid application of rules, rather than great achievement with occasional errors, produces a successful civil service career.

In addition to the formal personnel codes, organizations have an informal personnel code that determines what behavior

will actually be rewarded or sanctioned. For instance, corruption is invariably sanctioned in the official personnel code, but often tolerated in the informal code.¹ Behavior that maximizes individual or departmental goals to the detriment of organization-wide objectives can occur at all levels of an organization. Clearly, the informal personnel code has important consequences for x-efficiency.

Members of an organization interact with a large and diverse set of individuals and coalitions. Although the government is usually the chief actor with which the parastatal must cope, three other kinds of actors are important, and can exert considerable influence. First, if the parastatal includes a partner from the private sector, this partner will influence the parastatal with much the same tools as the government.

Second, powerful non-governmental groups can exert pressure on the parastatal in a variety of ways. For instance, unions whose membership includes parastatals' employees can apply formal pressure on parastatals. Informal demands on parastatal personnel include family and friends' requests for various kinds of favors. School and professional ties can also provide a medium for exerting informal pressure on parastatal decisionmakers.

¹The Indonesian parastatal bureaucracy has developed this to an art form.

Third, a parastatal's client can exert influence either formally or informally. For example, farmers' representatives may exert formal influence on parastatals devoted to agricultural development. Informal influence can take the form of vocal complaints, an informal consultative mechanism, or an organized exit of customers.¹ Clients can also coopt those members of the organization with whom they deal directly. For example, the doctor of one Ivorian town used his monopoly of local medical services to get extension workers to break a number of technical agricultural guidelines and establish a large plantation for him. In return, they were assured of medical attention.

¹See Hirschman, Exit.

1V. PARASTATAL X-EFFICIENCY IN TASK ENVIRONMENTS

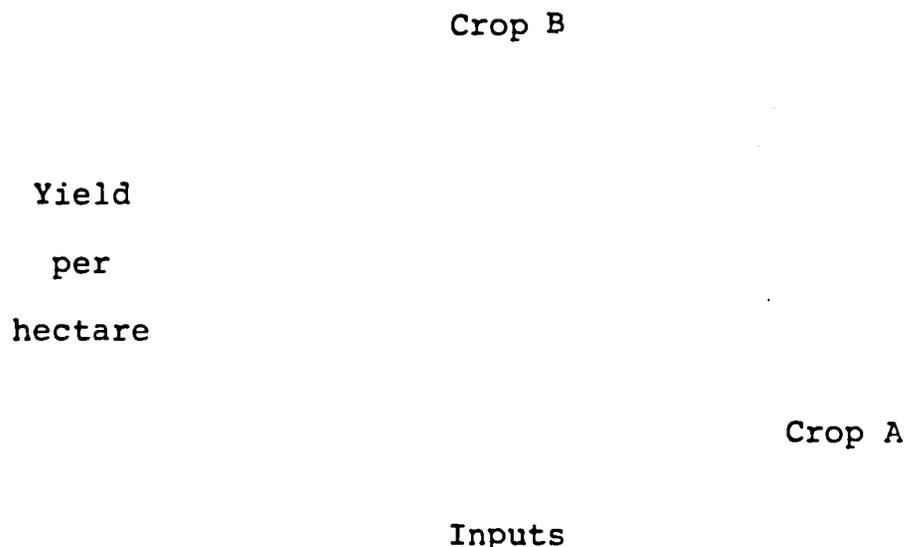
A. Task Environments

Parastatals undertake a wide variety of tasks using a wide variety of technologies. Each task/technology combination poses particular organizational problems.¹ Because parastatals face certain organizational constraints, they are better suited for some task/technology combinations than for others.

The chief constraints have been detailed in the above sections' investigation of factors contributing to x-efficiency. The task of agricultural development can be analyzed in terms of five aspects. Each aspect makes demands with which the organization must cope. Together, they indicate the level of environmental uncertainty. The aspects are: (1) the complexity of the task, (2) the stakes involved in success or failure, (3) the number of exceptions in the environment, (4) the lag time of feedback on performance, and (5) environmental diversity. Each of these aspects will be considered in turn.

¹See Eric R. Hermann, "Technology and Organization Appropriate for Private Enterprise in Developing Countries" (M.A.L.D. thesis, the Fletcher School of Law and Diplomacy, 1979).

Task complexity. Some crops produce adequate yields under a wide range of conditions; others do not. In the diagram below, crop A produces moderately over a wide range of input combinations.¹



Crop B demands much tighter coordination and control of inputs than does crop A, and probably requires many more inputs (e.g. multiple applications of fertilizer and pesticide). The job of implementing a program for crop B is therefore much more complex than implementing a program for crop A. Because crop B's yield declines precipitously if the input combination is wrong, decisionmaking authority on crop B cultivation techniques can only be decentralized to the farm level after a lengthy period of apprenticeship.

¹The graph's horizontal axis is a gross simplification.

Until then, a dense extension network and a complex input supply system are needed.

Some inputs that are critical to crop production are listed below. After each input is the major problem encountered, and a response.

<u>Input</u>	<u>Problem</u>	<u>Response</u>
soil	not all soil is good	-select fertile areas -test each farm's soil
water	variable supply	-select areas with adequate rainfall -develop hardy crop varieties -irrigate
sunlight	variable, too strong too weak	-shading crops if sun is too strong (e.g. shade trees for coffee)
land clearing	poorly done tardy	-extension agents enforce guidelines -clear land for farmers
seeds seedlings	poor quality not available on time	-improve nurseries -improve distribution system -if crops generate own seeds and seed cultivation is easy, decentralize to farmers and enforce guidelines
fertilizer pesticide	late or unavailable improper application wrong kind	-improve distribution system -enforce application guidelines -find best blend of fertilizer, best kind of insecticide -develop disease resistant varieties

<u>Input</u>	<u>Problem</u>	<u>Response</u>
weeding harvesting	labor bottlenecks	-bring in hired labor -animal traction -mechanized farming
cash for farmers to buy inputs and survive until harvest	farmers are poor, rural credit is scarce and rates usurious; some crops have a long gesta- tion period; some are harvested once a year (lumpy cash flow)	-provide rural credit -choose crops that have year-round harvest -develop fast maturing crop varieties -develop off-season employment
farm management	low skills levels of farmers	-dense extension network
access to farm	no roads	-rural roads program
crop purchase collection	inefficient expensive dishonest	-parastatal purchases and collects crops -parastatal policies private agents who purchase and collect crop
processing	spoilage of raw crop, all problems of industry in de- veloping countries	-make sure transpor- tation is efficient, decentralize pro- cessing factory -export crop unpro- cessed
prices of imported inputs and exported crop	volatile	-long-term contracts -stockpiling -cartels

The more complex the technical package, the higher the level of x-efficiency that is required from the implementing parastatal for it to avoid failure due to a critical bottleneck. Bottlenecks are especially problematic if the

parastatal must rely on other agencies for critical inputs. However, if the agency's investment in the crop (manpower, capital, prestige) is low, it can accept the risk. If the stakes are high, the parastatal will seek to control the input, for otherwise it courts disaster.

Stakes. Each crop technical package has a certain level of money, prestige and manpower that is at stake if a catastrophe occurs. Crops with economies of scale in processing, or which demand irrigation, entail major capital investments and are thus big stakes. High cost means that the development agency must remain heavily involved in production to ensure that it recoups the investment.¹

Exceptions. The higher the stakes, the more important and dangerous are exceptions. An implementing parastatal is not deeply threatened if one-quarter of its target population fails to take advantage of an inexpensive fertilizer that improves crop yield. However, for one-quarter of the resettled population of an expensive irrigation scheme to reject extension agents' directives augurs ill for the implementing agency. It is, therefore, likely that the irrigation/resettlement scheme agency will be more attuned to exceptions (i.e., recalcitrant farmers) than the agency purveying inexpensive

¹See Blume, Agro-Industrial Agencies; and Raymond G. Hunt, "Technology and Organization," Academy of Management Journal (September 1970), pp. 235-252.

fertilizer.

Exceptions are also determined by an organization's mission. As Perrow (1967) observed, a prison whose mission is custodial considers all inmates to be about the same. A prison devoted to prisoner rehabilitation considers each prisoner a unique case. The first prison faces few exceptions; the second faces many.

Organizations in a highly routine environment centralize power and at lower echelons operate according to standard procedures. Information is limited enough for upper management to cope with most decisions. Adherence to rules is important, performance tends to be measured by volume of output.

Organizations cope with an environment fraught with exceptions by decentralizing decisionmaking power to lower echelons. Otherwise top management is overwhelmed with detail and the employees who deal directly with clients are unable to adapt to the variety of situations. Only highly autonomous parastatals are likely to be able to decentralize sufficiently to cope successfully with this kind of environment.

Feedback Lag-time. Information on organizational performance is only available to top management after a certain lag, and usually available even later to authorities supervising the organization. The more remote the target area, the longer the feedback lag.

A second kind of feedback lag is the time gap between action and consequences, which varies significantly between annual and perennial crops. The day of reckoning is never more than one year away for an organization implementing a program for an annual crop. By contrast, a disaster in a perennial crop program may only have concrete effects several years after the event. A good example is the lack of palm planting in the Ivory Coast during the late 1970's, which will not have serious consequences until the mid-1980's. A lengthy lag of the second kind permits considerable irresponsibility and short-sightedness.

Diversity. An organization operating in a diverse environment will find that its technical package is effective only in a fraction of the cases for which it is responsible. Coping with this renders already complex tasks extremely difficult to implement, since alternative technical packages must be developed and selectively administered. Four kinds of diversity confront agricultural development agencies: administrative, geographical, infrastructural, and human.

Any organization whose scope of operations extends through more than one administrative bailiwick faces administrative diversity. Operating in several administrative domains may mean fighting bureaucratic battles several times over. Coordinating services becomes much more complex when

several essentially autonomous agencies are providing the same service in different places.

Geographical diversity is a function of variety in soils, terrains, and climates. Although geographical diversity within the target area may be small enough that a single technical package is feasible from an agronomic standpoint, this is rarely the case. Generally, two solutions to diversity are found. The development agency can confine itself to a homogeneous subsector of the environment. In practical terms, this means implementing a single technical package only where climate, soil, and terrain are appropriate.¹ Effective use of this strategy is exemplified by SODEPALM'S approach to coconut palm farming in the interior of the Ivory Coast. Farmers are encouraged to grow coconut in the poor soil of the valley slopes, while the wet valley floor is used for rice, and the rich soil of the plateaux is devoted to cocoa and coffee (rice, cocoa, and coffee are all handled by SATMACI).

A second, more difficult solution is to develop separate technical packages, each of which is appropriate to a relatively widespread variety of local terrain. For example, the CIDT encourages animal traction only in certain areas; mechanization is even more restricted.

¹An egregious variant of this approach is the agency that implements the package with little regard for climate, soil, and terrain.

Some target regions have excellent infrastructure for transportation, communication, and habitation; others may not. The logistics of an agricultural development program depend heavily on the target area's infrastructures. A fertile forest zone stretches across the Ivory Coast, but the contrast between the comparatively adequate infrastructure in the Southeast and the underdeveloped Southwest was so great that a separate parastatal was created (ARSO) to handle the Southwest.

Subsets of the target population will respond differently to the same crop development program, depending on their reactions to the technical packages. Key factors affecting farmer response are the availability of labor during peak seasons, and competition from alternative commercial crops or activities.¹ If these differ significantly within the target population, the pattern of farmer adoption will be skewed.

If a diverse environment is relatively routine, organizational subunits can each efficiently handle a particular environmental subsector using standard operating procedures. Chandler (1962:393) has found empirical support for this contention: loosely coordinated subdivisions are a characteristic structure for multi-product or multi-region firms in the United

¹Smallholders are discussed in detail in the next section.

States. This organizational form is quite compatible with the constraints facing parastatals.

If the environment is diverse, contains exceptions, and also changes, a more fluid organizational style is required. This is often the case, especially since the different partitions just described are almost never coterminous. Without an uncontested criterion to subdivide the environment, management cannot set up organizational subunits to deal with each environmental subsector. Parastatals are likely to be too rigid to function well in this kind of environment, unless they are highly autonomous.

B. Agricultural Development as a Joint Venture

Parastatals generally implement the task of agricultural development as a joint venture with another genre of organization: smallholder farms. Whether smallholders are receptive to a particular program depends on a number of factors: the availability of labor, especially at peak season(s); the availability of alternative sources of remuneration; the degree to which farmers are assured of a minimum food production; the traditional sexual division of labor and work-unit structure; decisionmaking styles and differences between farm production decisionmaking and household consumption decisionmaking; traditional fears and food preferences; farmers' level of modernization; existing social inequities; and traditional political structures.

Labor is the key constraint in West Africa. Labor bottlenecks inspire changes in cultivation techniques and crop mix: For example, cotton is

planted late and over an extended period principally to avoid peak labor demands; groundnuts are weeded late but perhaps more intensively with the same objective; and intensity of land preparation may be traded against intensity of weeding in grain crops. Frequently, modification in timing and substitutions of techniques among crops will be complemented by changes in the crop mix--a combination of groundnuts and cotton may facilitate more even labor use than concentration on groundnuts; root crops tend similarly to be more readily integrated with a cash crop than grains.¹

If a new technical package requires peak season labor, farmers are unlikely to adopt it--unless, of course, it is significantly more remunerative than alternative crops.

Availability of alternative commercial crops and occupations strongly influences adoption of technical packages. Shifting incentives elicit a rapid response. As the price of vegetables has risen in the Ivory Coast, farmers have increased their output, despite a near total lack of government assistance. The price of coconuts has remained low for several years, and recently a rash of farmers have felled their coconut trees to obtain palm wine and afterwards converted the plantations to a more promising crop: rubber trees. This has occurred in spite of excellent coconut palm extension services.

¹John H. Cleave, "Decisionmaking on the African Farm," IAAE Occasional Paper, No. 1 (November 1977), p. 164.

Farmers need a secure minimum of food. Until they achieve this minimum, commercial crops hold little interest. Cleave (1977:163) observes that unreliable marketing organization and a wide gap between selling and buying prices reinforce farmers' unwillingness to depend for food on the market. Extremely poor farmers are therefore likely to be skeptical of agricultural innovations.

The size and structure of work units vary both within and between ethnic groups. Some work units include hired labor; others do not. Farmers may desire to employ field hands, but be unable to tap a labor pool. Some families may be relatively small and hence face severe labor constraints. Others may have a plethora of working adults and be able to generate sufficient savings to make important investments. Size and structure of the work unit also affects the determination of which technical packages are organizationally feasible --e.g., it is likely that a single large family will utilize a pair of oxen more amicably than will three small families who must share a common pair.

Activities or crops may be allocated according to a traditional male/female division of labor, and this allocation may vary within the project area. In many cases, women devote more time to work at home and in the fields than do men. Thus, introducing a technical package whose chief cash crop either

falls into the women's purview or requires a lot of the traditionally "female" variety of fieldwork (usually weeding) may give poor results: the women are already fully occupied. A different crop, or a different presentation of the same crop so it is adopted by the men, may have excellent results. Another common division of labor allocates cash crops to men and subsistence crops to women. This may result in modern cash crop cultivation techniques being used alongside highly traditional subsistence crop cultivation methods. A review of eighteen completed agricultural projects found that sexual division of labor played an important role in farmer adoption of technical packages.¹

Decisionmaking may vary between subsets of the target population. A classic illustration of the importance of decisionmaking processes is that of the Cherokee Indians, whose decisionmaking process for important choices required complete consensus among all those concerned. If consensus was not reached, no action could be taken. As smallholders, the Cherokee raised hogs with great success. In large cooperatives, the Cherokee reached decisions very slowly, or were unable to make any decision at all: they spent an inordinate amount of time deliberating over decisions. In this case, organizational

¹IBRD internal document.

diseconomies of scale outweighed the technical scale economies.¹ Had the hog farmers been of a different ethnic group, the cooperative might have been a feasible strategy.

In some ethnic groups, women do most of the farming and thus choose the cultivation technique, and men control decisions about how to spend profits from the farming. The Bamiléké of Cameroon offer a good example of this pattern. A highly profitable crop that requires an increase in farm labor is unlikely to be adopted. For an ethnic group of this nature to embrace commercial agriculture requires that either men undertake some cash crop farming or women gain control of some of their production.

A common West African example of traditional fears and preferences is certain groups' attitudes towards cattle. If an ethnic group fears cattle and disdains milk products, it is a difficult target for a program of animal traction. Food crop programs must cope with the differing tastes of the target population's subsets. For example, a high-yield strain of maize grew excellently in Indonesia, but the populace

¹Oklahomans for Indian Opportunity, "Rural Development Program in Eastern Oklahoma Indian Communities," c.f. Stanley M. Davis, ed., Comparative Management: Organizational and Cultural Perspectives (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971): p. 128.

disliked its flavor, and consumed it only as a food of last resort.

Different degrees of modernization within the target population can significantly affect the pattern of innovation adoption. Farmers already familiar with modern farming techniques and cash cropping will probably be more receptive to profitable technical packages than their more traditional neighbors.¹

If the population targeted is the whole populace of a given area, traditional inequalities are very important. Due to initial differences in access to knowledge, extension workers, hired labor and so forth, an agricultural development project may exacerbate inequalities of wealth. Critics of the "Green Revolution" often cite this problem.

On a more political plane, ethnic groups outside the target population may resent their exclusion. The target population may contain all or portions of several traditional cultural or political units, each of which must be wooed. If the target population is already knit into a single traditional political unit, the existing authority structures may be of great service to the project.

¹Although one would expect farmers who have tried modern technical packages and failed to make a profit to be leery of further modern farming suggestions from development agencies, at least some oil palm farmers in the Ivory Coast behave as if they believe that failure can be transformed to success by even deeper involvement with the same cash crop.

Many of the above factors can render farms less than optimally x-efficient. The sexual division of labor, decisionmaking patterns, low levels of modernization, and traditional fears can all impair farm efficiency. African farmers average only about 1000 hours per year of field work--much less than Asian farmers. This also contributes to a low farm x-efficiency level.

However, as a partner in a joint venture for agricultural development, African farmers are relatively efficient and hard working compared with most agricultural parastatals. Consider the following worst case of parastatal ineffectiveness, drawn from the above section on x-efficiency. The parastatal has: a lack of clear organizational goals; frequent shortages of critical resources; slow, overly centralized, and/or politicized decisionmaking; and incompetent, rigid, unmotivated, and corrupt staff. Clearly, an important hypothesis to investigate is whether African farmers tend to operate more x-efficiently than African bureaucracies.

V. ASSESSING THE PERFORMANCE OF
AGRICULTURAL PARASTATALS

Every index of performance measures a subset of the full range of an organization's activities. Evaluating the implications of such diverse indices as "number of farmers adopting animal traction," "yield per hectare," or "rate of return on assets," requires a clear model of the organization's operation and clear links between stages of operation and indices measuring performance up to that stage. A performance index is generally either a direct measure of output or a ratio of input to output. Ratios often use money as a common denominator. "Tons of avocados" exemplifies a direct output measure; "cost per ton of avocados" is an instance of a ratio. Trends and moving averages are common and useful transformations of simple output and ratio indices.

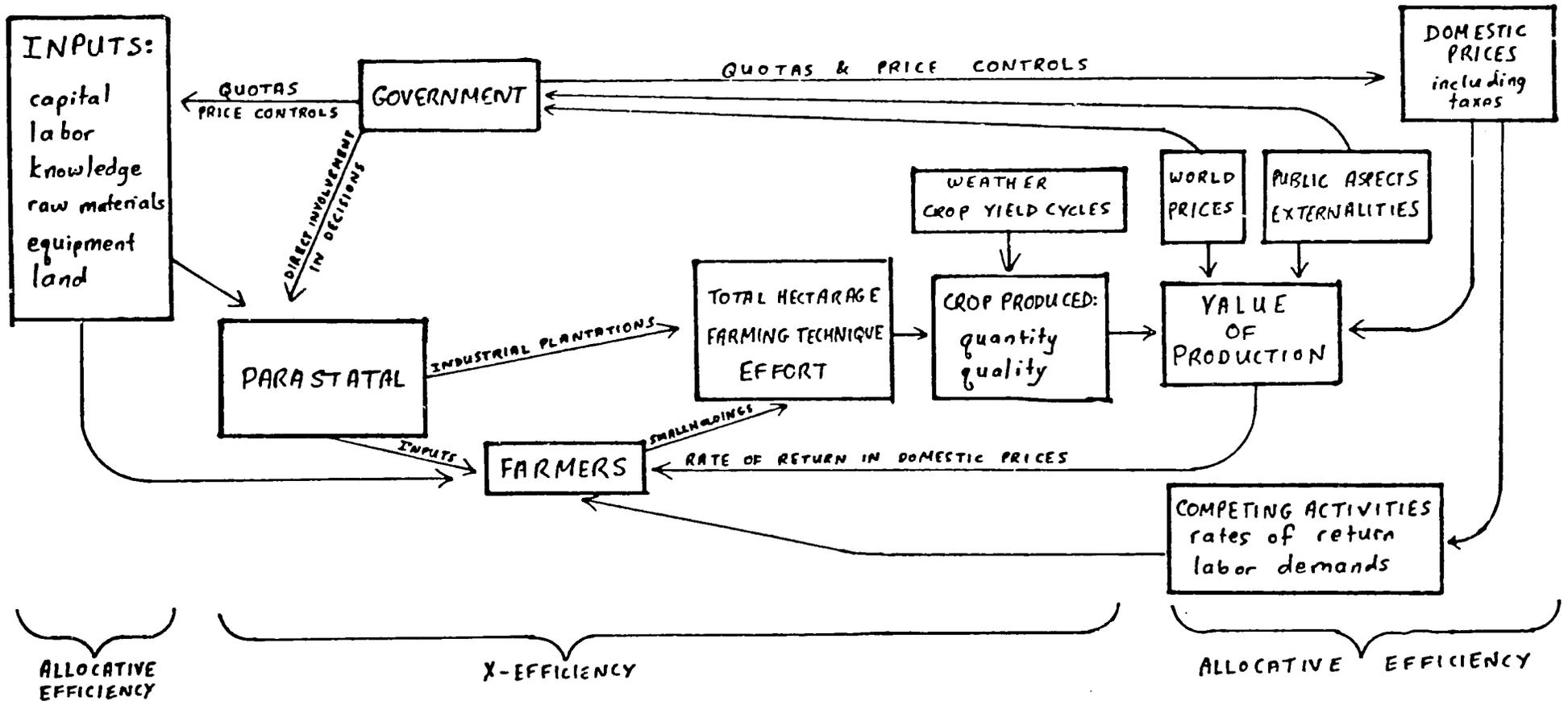
A simplified open system model of a parastatal devoted to the agricultural development of a commercial crop begins with a set of inputs whose prices are partially determined by the government. For the parastatal, these are exogenous variables. The parastatal either uses the inputs to engage directly in plantation agriculture or it uses them to provide goods and services to farmers cultivating smallholdings. Depending on the availability of alternative remunerative activities (a second

exogenous variable), farmers are receptive to the parastatal's efforts, and also the inputs from other sources. Together, the parastatal and farmers plant a certain hectarage and utilize certain farming techniques. Depending upon the quality of management and effort (and on the exogenous variables of weather and crop yield cycles) farmers and parastatal raise a certain quantity and quality of the crop. Depending on the exogenous variables of world, domestic, and shadow prices, the crop has a certain value. This value is an important determinant of future resources devoted to this crop. The system is represented in Figure 1, on the following page.

For a parastatal working with smallholders, the amount of goods and services provided to them is an important index of performance (e.g., hectares surveyed, farmers visited, tons of fertilizer distributed). The ratio of these goods and services to inputs is also useful, especially for measuring the parastatal's x-efficiency (e.g., cost per hectare surveyed, number of farmers visited per extension worker). Depending on the profitability and labor demands of alternative crops as well as of the parastatal's crop, farmers will choose to participate. The number of participating farmers is a key performance index for a smallholder oriented parastatal. A second index that includes issues of allocative efficiency is the socioeconomic makeup of the participating population of farmers. The most common ratio indicating performance at this

FIGURE 2

AN OPEN SYSTEM MODEL OF PARASTATAL OPERATION



stage is total input cost per participating farmer--an attempt to gauge the cost of rural employment, especially for resettlement schemes.

A parastatal may provide a plethora of inputs to an army of farmers, but the farmers may choose not to take advantage of the assistance. They may listen politely but do little, or they may enlist government aid to clear fields ostensibly for the parastatal's crop, but plant other crops instead. A useful measure of actual farmer commitment to a crop is hectareage planted in that crop. This index also evaluates the performance of parastatals engaging directly in plantation agriculture. The ratio(s) of cost per hectare (and cost overrun per hectare!) permit comparison of different crops and technical packages. They are especially useful for evaluating parastatals whose technical package entails considerable investment in land clearing, after which primary responsibility for production shifts onto the smallholder.

A further important indicator of the parastatal's impact is the level and trend of modernization of farming techniques. Examples of this index are the number of animal traction teams or tractors, and the number of farmers using fertilizer and/or pesticide. Modernization of farming techniques is rarely used to evaluate parastatals engaged directly in plantation agriculture, since it is usually assumed that they select the most appropriate level of modernization.

Extensive hectareage and modern farm technology can be

employed with varying degrees of efficiency. The quality of management and effort devoted to actual cultivation can be included in performance assessment by using indices that measure the amount and quality of crops produced. Total production, yield per hectare, per man-day, or per dollar of all inputs combined are common indicators. A measure that merits greater attention is yield per man-day per hectare, since its trend shows changes in the efficiency of cultivation taking into account changes in the availability of land. The level and trend in quality of the crop produced also indicates the x-efficiency with which the farmers and parastatal utilize inputs. Indices based on the quality and quantity of crop produced offer the most global assessments of parastatal x-efficiency.

However, in contrast to modernization and hectarage, production indices include two important exogenous variables: the weather, and crop yield cycles. High yields may result from good weather and a peak on the crop yield cycle--not from good management. Fluctuations due to the crop yield cycle can be eliminated by using a trend that includes several cycles.¹ Weather is a more erratic variable and patterns of clement or inclement weather can persist for a number of years. In the

¹Certain perennials, notably coffee, are exhausted by a bumper crop and produce little the subsequent year; this fluctuation is a crop yield cycle.

absence of either convincing research linking the yield of many tropical crops to weather conditions, or convincing detailed data on weather conditions in many developing countries, the best solution is to work with the longest term trends possible, and use moving averages to evaluate production, quantity, quality, and yield.¹

As indices, quantity and quality of crop production have two important drawbacks. First, they do not permit comparisons between the productivity of inputs employed for different crops. Knowing that a ton of avocados costs less to produce than a ton of oranges does not provide a guide for choosing between the two investments. Second, the quantity and quality of production do not indicate whether an investment in a particular crop has generated an acceptable rate of return on the resources utilized.

Assessing the productivity of inputs employed in one activity and comparing it to the productivity of inputs invested in another activity requires a common denominator for outputs and, depending on the measure, for inputs as well. An obvious candidate is money.² Converting crop production figures to

¹Standard techniques for analyzing trends are outlined in any intermediate statistics textbook. An interesting alternative is Bonnie H. Erickson and T.A. Nosanchuk, Understanding Data (Toronto: McGraw-Hill Ryerson, Ltd., 1977).

²Some scholars now suggest energy as the common denominator.

money permits calculating financial return per unit of land, labor, and capital utilized for the production of any crop. Converting all inputs to money allows the calculation of profits (or losses) and a key ratio: the overall financial rate of return for the project.

Financial rates of return have the strength of relating to a very real constraint: if revenue fails to cover costs, an enterprise must either obtain outside capital, reduce the scope of its activities, or close its doors permanently. However, world prices of agricultural commodities are extremely volatile, so financial rates of return based on the value of production over a short period may seriously over- or under-estimate the long term rate of return. For example, the project with the highest rate of return among eighteen agricultural projects¹ was a smallholder coffee project. The rate of return was calculated during a boom in coffee prices. Since then prices have been lower, and so the project's current financial rate of return is lower. A solution is to take long term price trends (keeping an eye on variance from the trend) and use those to calculate the rate of return.

A second problem is that the domestic prices used to calculate the financial rate of return for parastatal and smallholders often fail to reflect the social marginal opportunity costs of the goods and services involved. Maximizing

¹IBRD, internal document.

a rate of return based on inefficiently allocated prices will not maximize social welfare. The solution is to calculate a social rate of return based on estimated marginal social opportunity costs, arrived at by removing allocative inefficiencies from actual domestic prices. The possible allocative inefficiencies were outlined in the previous chapter: distorted prices, externalities and public aspects of inputs and outputs.

Distorted prices may mean that a financially lucrative enterprise is losing money for the nation as a whole. For example, if imported equipment and capital are subsidized through preferential access to low interest loans and foreign exchange at the official (overvalued) exchange rate, and outputs are subsidized through regulated high prices and a ban on imports, then it is likely that producing the output locally will be more expensive for society than buying the finished good on the world market.

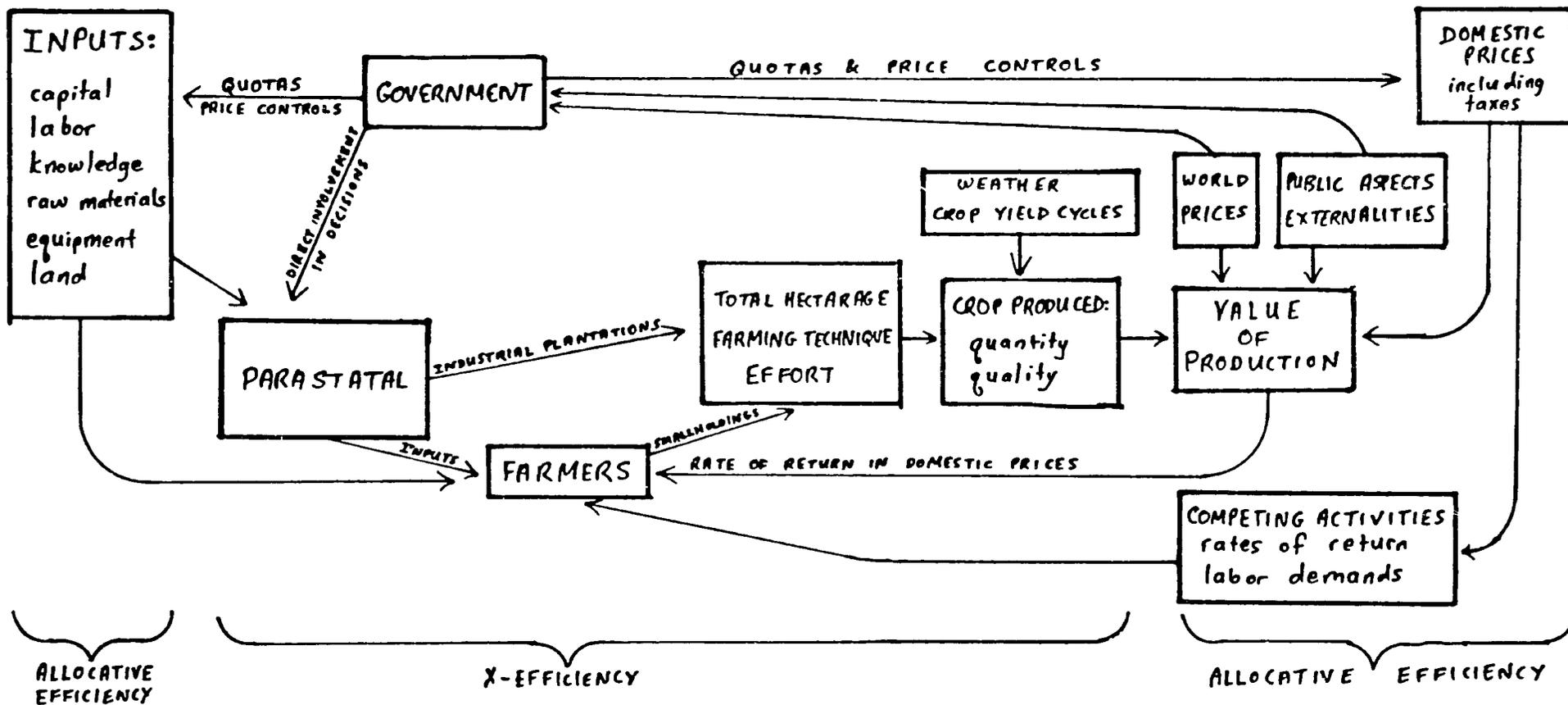
To convert private prices to marginal social opportunity costs,¹ subsidies must be removed from the prices of inputs and outputs. Similarly, taxes on output, which represent no loss in the social value of the output but merely a transfer of the value from the producer to the government, should be added back to the price of the output.

¹Calculation of projects' social rates of return is the subject of a sophisticated and growing body of literature. The interested reader should refer to the bibliography in Jenkins, "Performance Evaluation."

Externalities and public aspects are also excluded from the financial rate of return, yet are integral to the overall social value of any activity. The most common adjustment to the rate of return is to weight the income generated according to the socioeconomic bracket in which it is distributed, so that a project generating an incremental million dollars for the poorest of the poor is worth more (to society) than a project generating an incremental million dollars for expatriates and the wealthy. Distribution between the public and private sectors and between regions can also be weighted.

Evaluating the performance of a parastatal and/or smallholders by calculating a social rate of return on investment is the most comprehensive measure of the overall efficiency of an activity. It includes both x-efficiency (which is what is commonly referred to as performance) and allocative efficiency. The social rate of return, however, has two drawbacks. Because it is such a global measure, it requires a tremendous amount of data for its calculation.¹ Second, it does not distinguish between the contributions of x-efficiency and allocative efficiency. Since their policy implications are very different, this paper advocates keeping the two issues as separate as possible.

¹Thorough calculation of the social rate of return remains rare and noteworthy enough that as recently as 1977 the World Bank published an example: Johannes F. Linn, "Economic and Social Analysis of Projects: A Case Study of the Ivory Coast," World Bank Staff Working Paper 253 (Washington, D.C.: The World Bank, May 1977).



PERFORMANCE INDICES			
FARMERS PARTICIPATING: - total, trend - inputs per farmer participating INPUTS PROVIDED: - total, trend - cost per input (inputs: seed, fertilizer, extension, land surveying, insecticide, etc..)	HECTARAGE: - total, trend - inputs per hectare MODERNIZATION OF CULTIVATION: - level, trend - inputs per increase in modernization	YIELD: - total yield per unit of: • land • labor • capital • all inputs - trend in yield QUALITY: - level, trend	VALUE OF PRODUCTION: - total in: • world prices • domestic prices • shadow prices - trend RATE OF RETURN: - total in: • world prices • domestic prices • shadow prices - trend

The above discussion of the effectiveness of a particular form of organization (i.e., parastatals) naturally concentrates on the organizational efficiency of production (i.e., x-efficiency). However, to attain the condition of ceteris paribus required for comparing different parastatals' x-efficiency means analyzing allocative efficiency. Specifying the prerequisites of allocative efficiency defines deviations from the norm. Broadly stated, allocative efficiency requires that:

- (a) inputs should be paid for at marginal social opportunity cost--world prices for traded goods, other calculations for non-traded goods; this means that the enterprise may have somehow to be charged different prices from market prices;
- (b) social considerations should be treated explicitly and quantitatively, and if necessary built into an appropriate cost-benefit calculus;
- (c) the gross rate of return earned on public capital should be at least equal to the social opportunity cost of capital whatever that might be;
- (d) tax treatment of public enterprises should be consistent not only with optimum balance between the public and private sectors, but also with optimal resource allocation within the public sector.¹

After describing the Ivorian agricultural sector, this paper will analyze the allocation of resources in the Ivory Coast. The differences between the domestic resource cost of

¹Marris, "Comparative Efficiency," pp. 21-22, summarizes Gillis, "Efficiency in State Enterprises," pp. 25-30.

various crops will be investigated for indications of allocative inefficiencies. Then the paper will discuss the institutional structure of the parastatal sector and examine factors generating x-efficiency. Based principally on the three detailed case studies, patterns of parastatal success and failure will be outlined.

PART II
AGRICULTURE AND THE PARASTATAL
SECTOR IN THE IVORY COAST

VI. AGRICULTURAL DEVELOPMENT
IN THE IVORY COAST

A. Background

Climate and Crops. The Ivory Coast falls into four ecological zones: littoral, Guinean forest, forested savannah, and Sudanese savannah. The northern Sudanese savannah has a single rainy season from June to September with average annual precipitation of only 1100 millimeters. The southern Guinean forest has two rainy seasons (May to July, September to October) and annual averages vary from 1400 to 2000 millimeters of rain. Between the two zones stretches a transitional band of forested savannah with two rainy seasons but lower precipitation than the Guinean forest. In the Southeast, the forest is bounded by a coastal strip of sandy soil about thirty kilometers wide. This littoral received abundant rainfall, reaching an annual average of 2500 millimeters in the extreme Southeast.

The littoral in immediate proximity to the ocean is well suited for only a single commercial crop: coconut palm. Towards the interior of the littoral, oil palm, rubber, and banana grow well. The most lucrative tree crops (coffee and cocoa) flourish in the Guinean forest, as does pineapple. The forested savannah is too arid for coffee, cocoa, or pineapple,

but is a hospitable environment for upland rice and cotton. Farther north, the Sudanese savannah produces very high quality cotton. Sugar grows well throughout the savannah zones.

Ivorian food crop production can be divided roughly along the North/South axis of the Bandama river. East of the Bandama, the staple tends to be yams; to the West it is rice. In the extreme North, millet and sorghum dominate, and on the littoral the poor soil dictates a staple diet of cassava. In the southeastern rainforest region close to Ghana, the inhabitants subsist chiefly on taro and plantain. The maps on the following pages illustrate the patterns of rainfall, vegetation, and food crop production.

Traditional Societies and Agriculture. As in most nations on the West African coast, the population of the Ivory Coast consists of animist and Christian Bantu and semi-Bantu tribes inhabiting the coastal forest zone, and Islamic Sudanese tribes inhabiting the savannah region in the interior. The eastern half of the Ivorian forest is populated by tribes belonging to the Akan civilization that stretches from the middle of the Ivory Coast to the Togolese border. The western forest zone makes up part of the Krou culture extending west along the coast to Monrovia. Voltaic tribes occupy the central and eastern savannah; Mandingué and Mandé respectively populate the western Sudanese savannah and forested savannah.

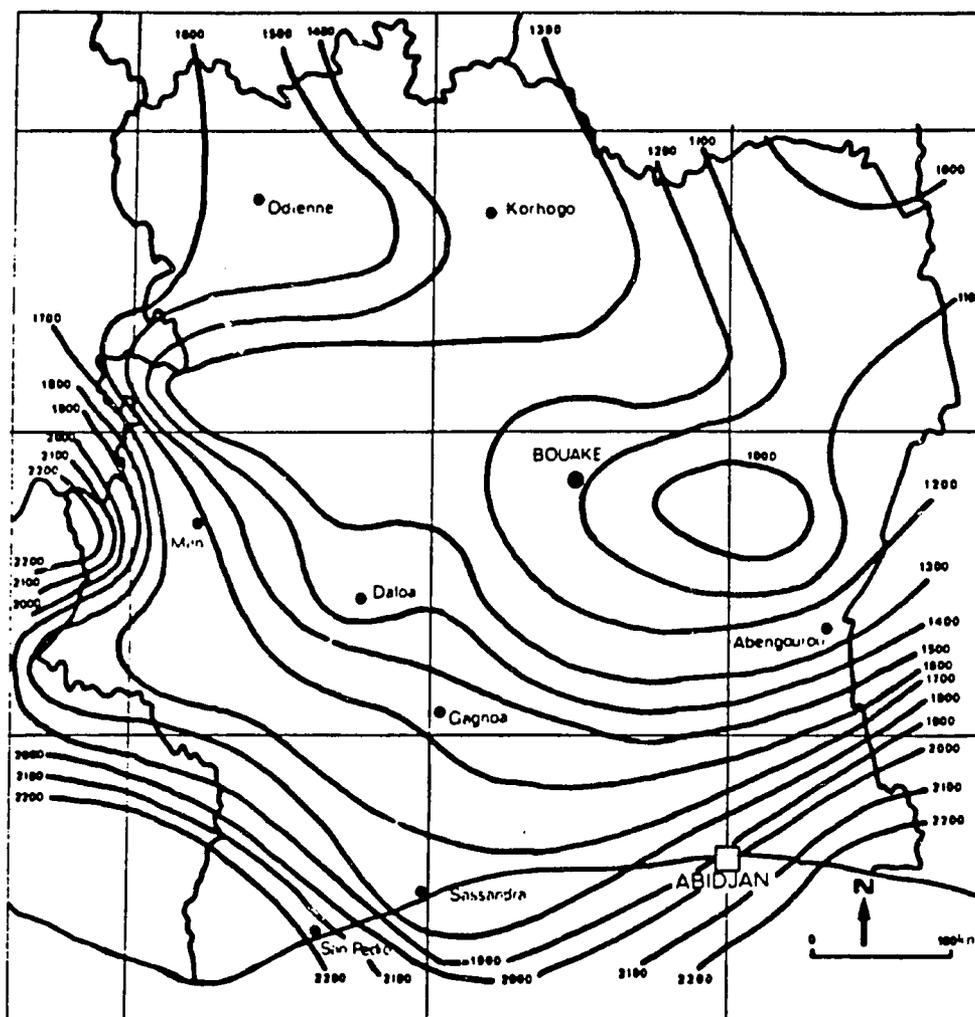
Traditional political systems vary tremendously between

these cultures. The Akan tribes developed sophisticated, centralized, and hierarchical polities--the most powerful Ivorian example is the Baoulé kingdom. In other cultures, such as the Mandé, political organization remained relatively rudimentary. Land tenure ranged from complex and formal systems to primitive systems with little concept of proprietorship or usufruct. Shifting cultivation predominated; political power tended to stem from control of people, not land.¹

Traditional agriculture in the Ivory Coast was characterized by smallholders cultivating subsistence crops on abundant land. Sparse population meant that subsistence could be assured with relatively little agricultural labor, especially in the forest zone. Adverse ecological conditions (primarily aridity) in the savannah regions kept agricultural labor productivity there lower than in the more fertile forest, but neither in forest nor savannah did fieldwork approach the grueling levels common in Asia. Nascent commercial agriculture in the form of the kola trade existed for centuries. The forest peoples, however, gathered kola nuts rather than cultivating them; this activity left essentially unchanged the structure of agricultural production.

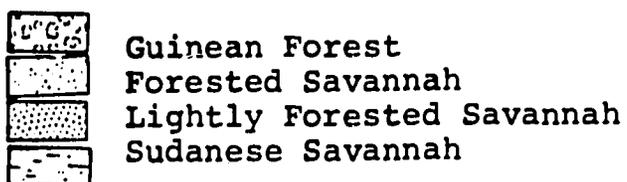
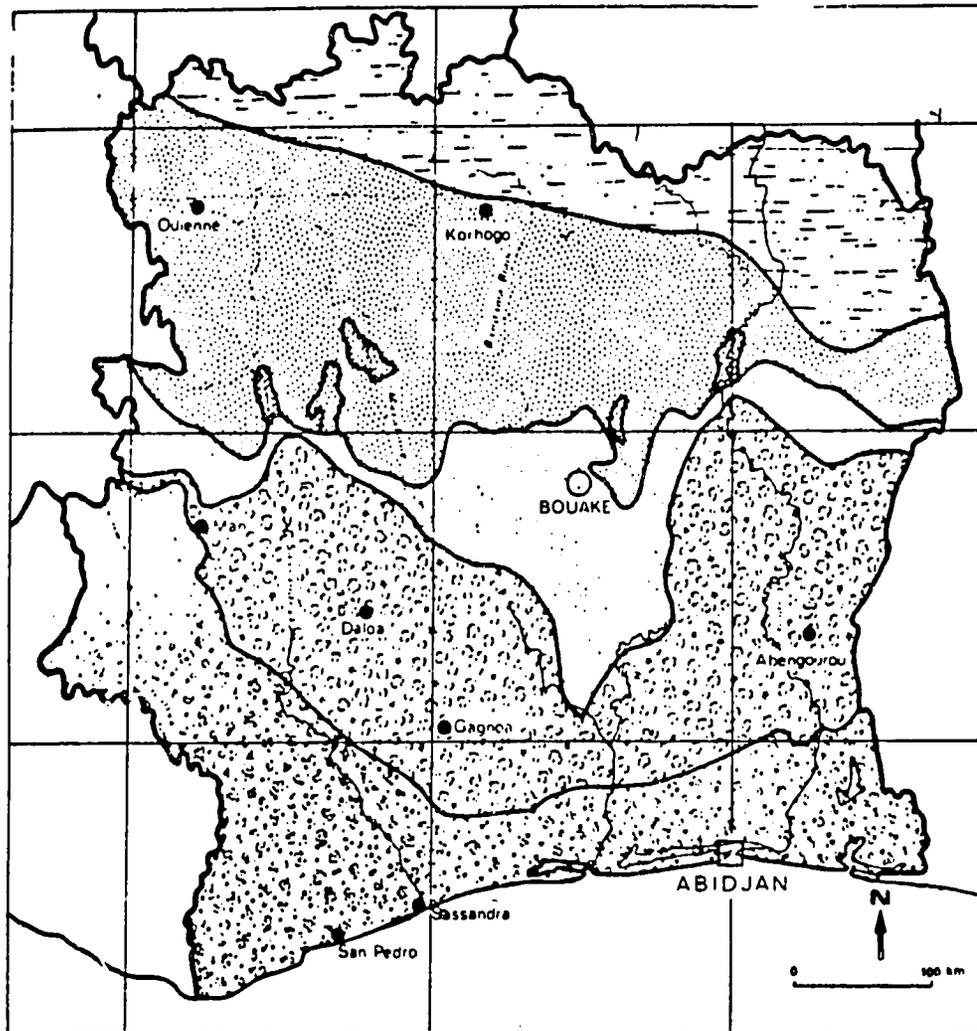
¹For a particularly insightful analysis of land tenure and political organization among the Agni of the Southeastern forest zone, and the effect commercial tree crops had on these traditions, see Rodolfo Stavenhagen, "Agricultura Comercial y Relaciones de Clases en Costa de Marfil," in Las Clases Sociales en las Sociedades Agrarias (Mexico City, Mexico: Siglo Veintiuno Editores, 1969, 1975), pp. 145-190.

FIGURE 4
 MAP OF ANNUAL RAINFALL
 IN THE IVORY COAST
 (millimeters)



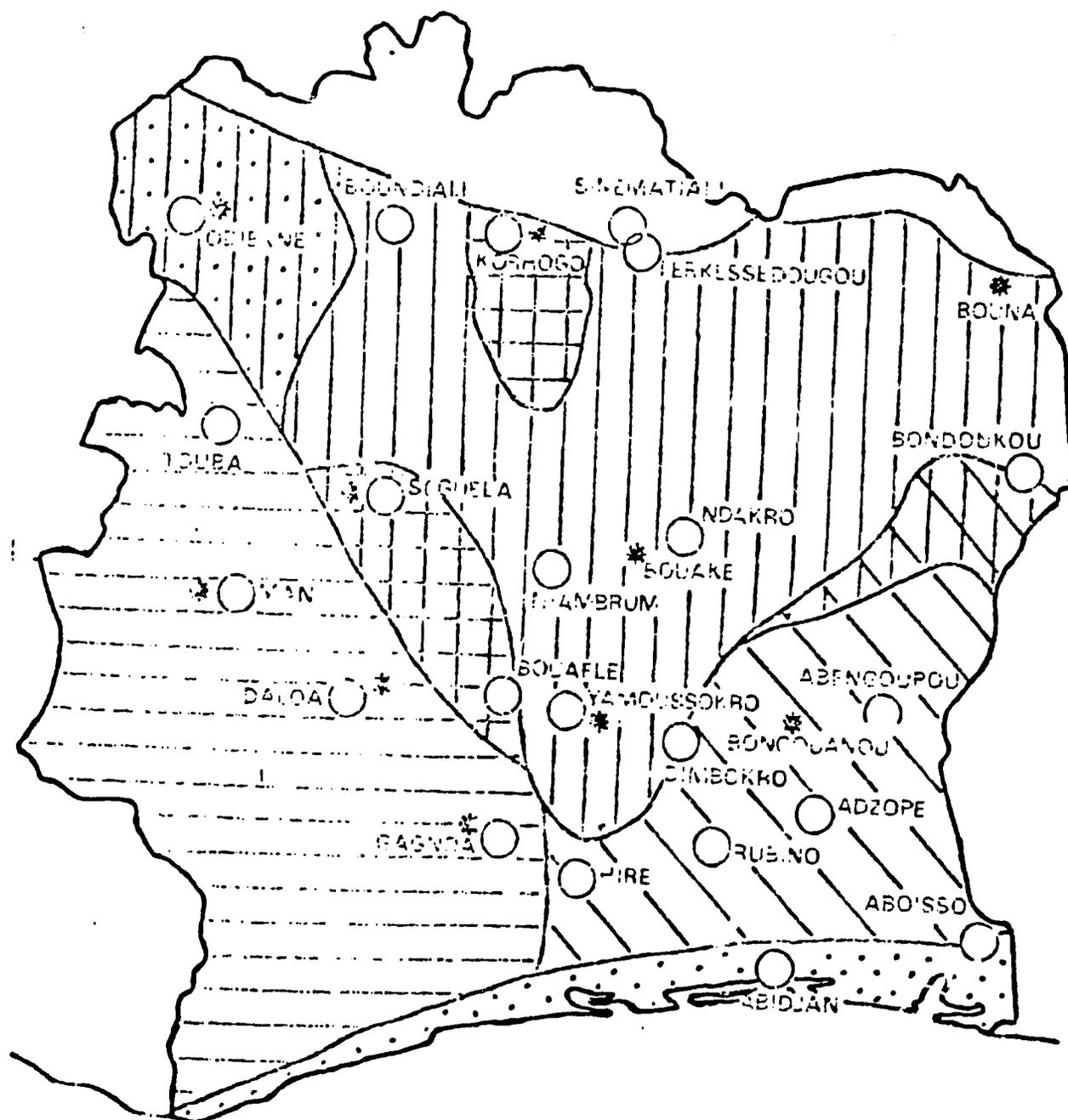
Source: Ministère de l'Economie, des Finances, et du Plan, *La Côte d'Ivoire en Chiffres*, Edition 1979-1980 (Abidjan: Société Africaine d'Édition), p. 10.

FIGURE 5
 MAP OF VEGETATION IN
 THE IVORY COAST



Source: Ministère de l'Économie, de Finances, et du Plan, Chiffres, p. 12.

FIGURE 6
MAP OF FOOD CROPS IN THE
IVORY COAST



▨ Sorghum, millet

▧ Yam

▩ Cassava

○ Market Vegetables

▨ Plantain, Taro

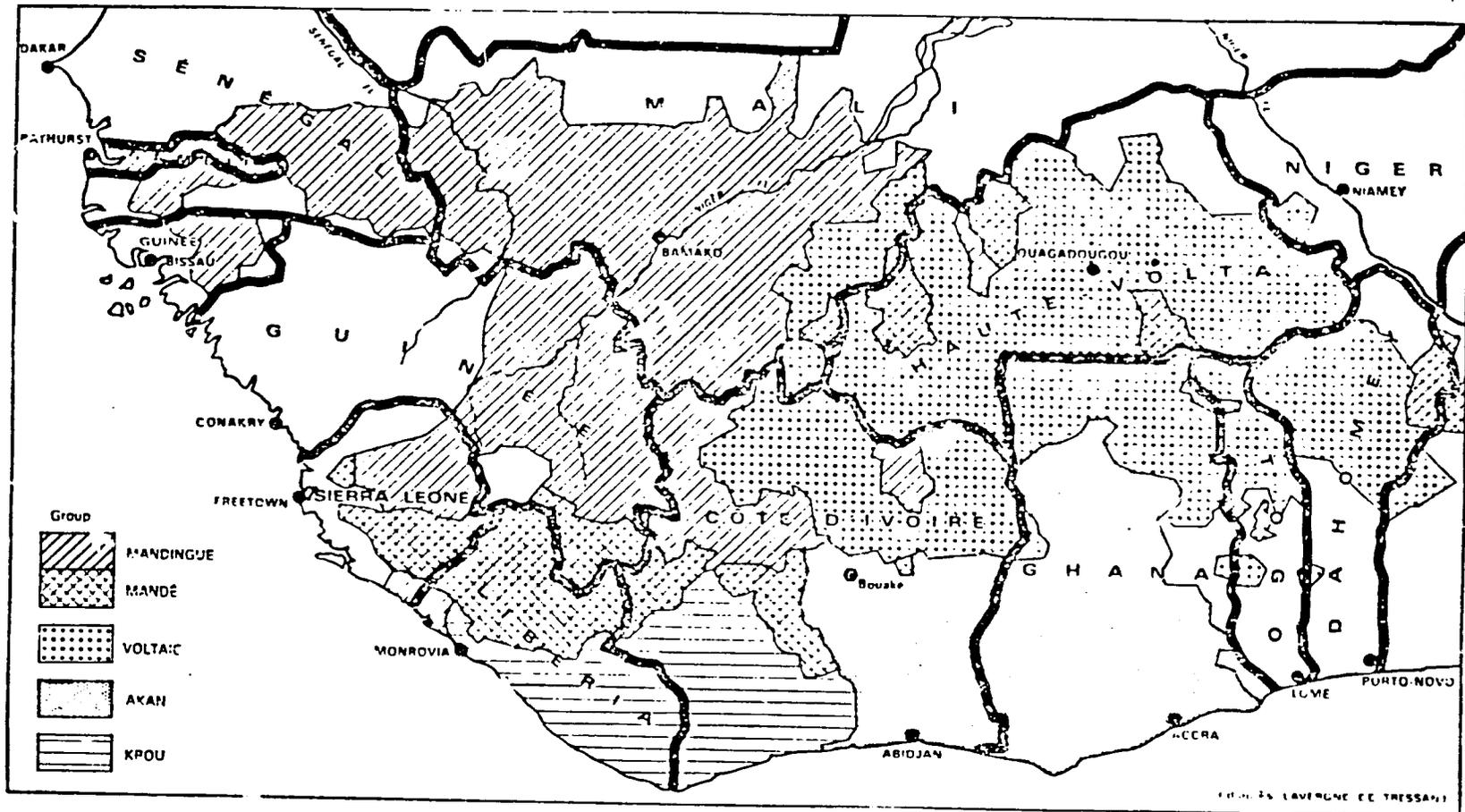
▧ Rice

* Irrigated Rice Paddy

Source: René Pomel and Francis Pons, "L'Agriculture Ivoirienne" (Abidjan: Ministère de l'Education Nationale, 1977).

FIGURE 7

MAP OF ETHNIC GROUPS IN THE IVORY COAST AND THE SURROUNDING REGION



Source: Abdoulaye S. wodogo, "L'Agriculture en Côte d'Ivoire (Vendôme: Presses Universitaires de France, 1977), p. 214.

B. History of Ivorian Commercial Agriculture

The population of precolonial West Africa concentrated in the Sudanese savannah. Complex civilizations arose, fed by the wealth that flowed from their position along the great inland trade routes. The sophistication and affluence of these medieval West African empires reached a remarkable height, as the following passage illustrates:

The (Arab) geographer Ibn Hawqal saw in 951 a bill of credit made out to a trader from Awdaghust in Ghana, the sum of which (42,000 dinars) was unheard of in the muslim world at that time. And when Mansa Musa, the king of Mali, went on a pilgrimage to Mecca in 1324 his gifts and expenditures were so munificent that a temporary surfeit of gold in Egypt caused general price inflation there for a long period.¹

With the arrival of the European traders in the fifteenth century, and the phenomenal decrease in the cost of sea transport during the centuries that followed, the focus of West African trade shifted to the coast, and export by ship. Formerly depopulated and in general subservient to the Islamic savannah civilizations, the coastal peoples were the middlemen of the new maritime trade routes. The once preeminent savannah became a reservoir of cheap labor for southern construction, mining, and plantation agriculture. Colonial authorities invested tax receipts and aid from the metropole chiefly in ports and in infrastructures spreading out from the ports, which exacerbated the gap between the stagnant North and a rapidly developing South.

¹Keith Hart, The Development of Commercial Agriculture in West Africa, Discussion paper prepared for the United States Agency for International Development (Washington, D.C.: USAID, October 1979), p. 8.

The underdeveloped and underpopulated southwestern region of the Ivory Coast is a notable exception to the North/South pattern that, nevertheless, demonstrates the compelling impact of the colonial experience. Full title to 300,000 hectares surrounding San Pedro was granted as a reward to a French trader who distinguished himself during the Franco-Prussian war of 1870. The trader, Verdier, neglected his domain and the local population gradually migrated, like their northern comrades, to more bustling areas.¹

To facilitate administration of their possessions along the Gulf of Guinea, the French government created the colony of the Ivory Coast in 1893. Like most West African nations, the political unit held no indigenous logic, encompassing some sixty disparate ethnic groups. In agricultural terms, the new territory held enormous potential, second only to Guinea among the colonies of the subsequent federation of French West Africa. Initially, the natural wealth of the forest was harvested and exported: timber, rubber, palm kernels, and crudely processed palm oil. At the turn of the century, plantation crops (coffee and cocoa) still accounted for less than one percent of agricultural export volume (see table 1).

Missionaries introduced coffee to Southwestern Ivory Coast in 1870; a decade later Verdier established the first plantation in the Southeast. Verdier and Bretinières planted the first

¹See Abdoulaye Sawodogo, L'Agriculture en Côte d'Ivoire (Vendôme, France: Presses Universitaires de France, 1977), p. 199.

cocoa in 1888. Ivoirians initially regarded these crops with intense distrust, believing that a farmer who cultivated cocoa would die before his trees bore fruit.¹ Strenuous resistance ceased only when familiarity with cocoa and awareness of its profitability combined with coercive colonial policy instituted during 1910-1912. By 1920, the Ivory Coast was exporting over one thousand tons annually. However, compared to twenty thousand tons of palm kernels and oil, and forty-six thousand tons of timber, the importance of cocoa remained small and coffee miniscule.²

During the period between World War I and World War II, the composition of Ivorian exports shifted significantly. Palm and timber, previously the mainstays, were supplanted by coffee and cocoa. Since both timber and palm products were gathered without an investment or time lag in cultivation, export volumes were highly price elastic. Prices and export tonnages peaked during the 1920s and thereafter stayed at low levels: until after World War II for timber, and until the post-independence era in the case of palm oil. By contrast, hectarage planted in coffee and cocoa expanded dramatically,

¹The Portuguese first brought cocoa from the Amazon to Africa in 1822. For a description of Ivorian suspicion and resistance, see *ibid.*, p. 205.

²Coffee exports, in fact, declined from a minute twenty-four tons in 1900 to seventeen tons in 1920. Although cocoa exports were more impressive, they remained tiny compared to those of Ghana.

TABLE 1
 PRINCIPAL PRE-INDEPENDENCE AGRICULTURAL
 EXPORTS OF THE IVORY COAST
 1905-1960 (TONS)

Year	Coffee	Cocoa	Fresh Bananas	Palm Kernels	Palm Oil	Rubber	Wood
1905	29	2	-	2,169	3,281	1,180	9.6 ^a
1910	35	8	-	5,423	5,955	1,372	13.8 ^a
1915	11	114	-	6,113	4,983	218	17.9 ^a
1920	17	1,036	-	10,966	8,655	41	64.1 ^a
1925	52	6,278	-	14,581	8,491	308	128.8 ^a
1930	445	22,239	2	10,964	6,439	19	90.9
1935	5,183	43,565	4,360	5,825	2,283	25	46.0
1940	15,606	45,359	6,396	6,030	2,420	23	23.2
1945	37,872	26,936	1,457	6,487	1,606	822	10.1
1950	54,189	61,686	22,965	9,679	999	-	106.1
1951	59,539	55,452	16,063	10,109	1,012	-	131.1
1952	64,099	50,171	17,991	4,778	1,788	-	75.3
1953	50,423	71,695	21,322	11,180	1,225	-	127.6
1954	88,292	52,704	20,939	6,915	1,300	-	131.5 ^b
1955	84,796	75,210	26,957	10,514	1,793	-	170.0
1956	119,638	75,783	24,681	12,858	1,528	-	225.0
1957	102,656	66,542	34,720	11,957	1,773	-	276.0
1958	113,500	46,335	46,198	17,255	845	-	426.0
1959	107,230	63,270	54,009	14,627	1,401	-	475.0
1960	148,583	62,935	72,658	16,354	1,821	-	694.0

^aThousands of cubic meters.

^bSince 1955 includes billets as well as logs.

Source: Howard J. C. Elliot, "A Benefit-Cost Analysis of Smallholder Tree Crops in the Ivory Coast" (Ph. D. dissertation, Princeton University, 1977), p. 4. Elliot obtained his data from the Central Bank (BCEAO) and the Ministry of Agriculture.

reaching 300,000 hectares by the end of World War II. Logs and oil palm products accounted for ninety-nine percent of export tonnage in 1900; in 1945 they constituted only twenty-two percent of total export volume.

As agricultural activity gradually shifted from gathering export crops to cultivating them, the colony felt the need for an agricultural service. Created in 1913, the Service de l'Agriculture was not, at first, very effective. It followed the organization of the general administration which was based on circonscriptions (districts). The Commandant of each circonscription ruled as a feudal baron: even on technical agricultural questions, the Commandant had the final word. A 1928 Agriculture Service report on the regional farm in Soubré noted that "in Soubré (cocoa plants were) an awkward and illogical height, due to the efforts during 1925-1926 of the staff at the station who were following the orders of M. Chartier, the district Administrative Commander... (T)hese same procedures were taught to the natives."¹

Agricultural research stations appeared early in the colonial era. Compared to its neighbors, the Ivory Coast has benefited from an unusually comprehensive and longstanding program of agricultural research. The most important of the early farms (in Bingerville) received valuable plants from all parts of the French Empire: strains of rubber trees, ylang-

¹Rapport du service de l'Agriculture (1928), c.f. Sawodogo, L'Agriculture, p. 204. Author's translation.

ylang, sisal, soja, cocoa, and coffee. As early as 1922, the Service de l'Agriculture established a research station devoted solely to oil palm. The era of specialized research institutes began in earnest with the Second World War. Vichy's policy of autarky led it to create institutes devoted to research in oil palm (IRHO), cotton (IFCT), rubber (IRCA), fruit and essences (IFAC), and forestry (CTFT).

These research institutes formed part of a tremendous expansion in state intervention that occurred during the war years. Desperate to assure adequate supplies of raw materials, the European metropolises broadened and strengthened their control over economic life in their colonies. Throughout West Africa, they instituted economic planning and established marketing boards.¹

The colonial government intervened inequitably in several key aspects of agricultural production. From 1919 to 1945 it maintained a policy of forced labor, annually impressing for six-month terms an average of twenty thousand Africans, many of whom were planters compelled to abandon their own plots. The majority of these Africans labored on Europeans' plantations. During World War II, government discrimination in favor of European planters intensified. In the case of coffee, Europeans received a farm maintenance premium of twice

¹With regard to marketing boards, see P.T. Bauer, West African Trade (Cambridge, England: Cambridge University Press, 1954).

that offered to Africans (and only to those rare Africans cultivating at least twenty-five hectares of coffee).

Discrimination for cocoa was even greater: European planters received 4.5 francs per kilo while Ivorian planters were paid only 2.6 francs. Responding to this inequity, the President of the Chambre d'Agriculture replied:

We do not have the same needs; you Africans do not go on holiday in France and you do not eat bread but yams. Do not count upon me to play the demagogue and intervene on your behalf.¹

Although victims of discrimination, Ivorians were neither evicted from the best land (as in the "White settler" colonies of East and South Africa), nor banned from cultivating remunerative tree crops. In fact, throughout the colonial period, Ivorian holdings increased. Because profits from cocoa and coffee exceeded government salaries available to Africans, the Ivorian elite joined the peasantry in cultivating coffee and cocoa.

When the Great Depression struck, world cocoa and coffee prices plummeted and remained low. Because African plantations had much lower fixed costs than the more modern European plantations, and because African farmers' opportunity cost for their own labor lay well below that of Europeans, Ivorians continued planting while Europeans disinvested. Gradually,

¹Pierre Du Prey, La Côte d'Ivoire de A à Z (Abidjan: Textu, 1970) p. 62., c.f. Howard J.C. Elliott, "A Benefit-Cost Analysis of Smallholder Tree Crops in the Ivory Coast" (Ph.D. dissertation, Princeton University, 1977), p. 191.

this raised the Ivorian share of total hectarage devoted to coffee and cocoa.

Scarcity of labor and lack of markets during World War II exacerbated the Europeans planters' financial plight. Cocoa exports fell from 55,000 tons in 1939 to 543 tons in 1943. By the time prices and production rebounded in the 1950s, independence was looming in the distance, and forced labor had been abolished.¹ In the case of coffee, the coup de gr[^]ace was administered by the blight of 1949-1951 which ruined thousands of hectares in the Daloa region where European plantations clustered. By Independence in 1960, Europeans owned less than one percent of total cocoa and coffee hectarage. Tables 2 and 3 clearly document the replacement of European planters by Ivorians. Unlike peasants in the "White settler" nations of East and Southern Africa, by the time the country obtained independence, Ivorian farmers had developed a longstanding acquaintance with commercial agriculture.

C. Importance of Commercial Agriculture

Economic Growth. Agriculture currently contributes approximately twenty-five percent of Ivorian GNP. However, gross national product accounting procedures underestimate the agricultural sector's importance by assigning to other sectors all taxes, trade margins, transportation, and value-

¹Charles de Gaulle abolished forced labor in 1946.

TABLE 2
 AREA PLANTED IN COFFEE BY
 EUROPEANS AND AFRICANS

<u>Year</u>	<u>European (hectares)</u>	<u>African (hectares)</u>
1936	24,000	6,000
1950	14,900	178,000
1955	7,200	303,700
1960	3,000	506,300

Source: adapted from Elliott, "A Benefit-Cost Analysis,"
 p. 109.

TABLE 3
 AREA PLANTED IN COCOA BY
 EUROPEANS AND AFRICANS

<u>Year</u>	<u>European (hectares)</u>	<u>African (hectares)</u>
1950	6,200	152,200
1955	3,500	184,900
1958	2,600	210,000

Source: adapted from Elliott, "A Benefit-Cost Analysis,"
 p. 192.

added from processing of agricultural commodities. In fact, agriculture was and remains the mainspring of the Ivorian economy, employing directly or indirectly seventy-five percent of the workforce, and providing much of the capital and raw material for the industrial sector. Fully half of industrial value-added derives from processing agricultural products. Including forestry, agricultural raw and processed exports consistently produce over eighty percent of export receipts.¹

During the quarter century between 1950 and 1975, the gross national product of the Ivory Coast averaged an annual growth rate in real terms that exceeded seven percent. Real per capita income more than doubled, in spite of accelerating population increase (which reached an annual average of six percent from 1970 to 1977). This long term expansion significantly outstripped all of the Ivory Coast's neighbors. Even Ghana and Guinea, which both possess considerable agricultural and mineral potential, achieved annual real GDP growth of only 2.8% and 3.8%, respectively.²

¹See World Bank, Ivory Coast: The Challenge of Success (Baltimore, Md.: Johns Hopkins University Press, 1978), pp. 35-36, 338-339.

²The Ghanaian average runs from 1965 to 1974; the Guinean average runs from 1960 to 1975. Both figures are from Shankar N. Acharya, "Perspectives and Problems of Development in Low Income, Sub-Saharan Africa," in Two Studies of Development in Sub-Saharan Africa, World Bank Staff Working Paper no. 300 (Washington, D.C.: World Bank, October 1978).

Excepting oil rich and sparsely populated Gabon, the Ivory Coast now boasts the highest per capita GNP in Black Africa, approaching \$1,200 in 1979.¹ Ivorian income distribution is not egregiously inequitable by African standards, so the nation's high per capita GNP indicates a median standard of living far superior to that of Ivorians' West African neighbors. The following table comparing per capita GNP throughout West Africa in 1978, shows a level in the Ivory Coast over five times greater than in Upper Volta, and over seven times higher than in Mali.

Ivorian economic growth has been fueled by tremendous expansion in the volume of agricultural exports. During the period from 1950 to 1975, cocoa export volume quadrupled, coffee quintupled, and timber increased thirty-fold. From Independence in 1960, to 1978, oil palm production tripled, coconut production expanded by a factor of 12.9, cotton by a factor of 17.7; and export volume of both pineapple and citrus cultivated for essential oil increased even more rapidly. Coffee and banana export volumes stagnated but, nevertheless, total tonnage of agricultural exports more than tripled since Independence. Excluding timber, tonnage nearly sextupled.

Ivorian commercial agriculture has not only expanded but has also diversified. Comparing the Ivory Coast with the other

¹United States Department of Agriculture, Kenneth L. Murray, Agricultural Attaché, "Ivory Coast Agricultural Situation," Report no. IV 0003 (Abidjan: American Embassy, February 1980), p. 1.

TABLE 4
COMPARISON OF PER CAPITA GNP IN
SELECTED WEST AFRICAN COUNTRIES

<u>Country</u>	<u>1978 Per Capita GNP in U. S. Dollars</u>	<u>Percent of Per Capita GNP in the Ivory Coast</u>
Ivory Coast	840	100
Nigeria	560	67
Liberia	460	55
Ghana	390	46
Senegal	340	40
Togo	320	38
Mauritania	270	32
Benin	230	27
The Gambia	230	27
Niger	220	26
Sierra Leone	210	25
Guinea	210	25
Guinea Bissau	200	24
Upper Volta	160	19
Cape Verde	160	19
Mali	120	14

Source: calculated from World Bank, 1979 World Bank Atlas
(Washington, D.C.: World Bank, 1979), p. 12.

members of the Communauté Economique de l'Afrique Occidentale (Senegal, Mauritania, Niger, Upper Volta, and Mali) reveals a marked contrast between Ivorian agriculture, with one dozen major commercial crops, and the other member countries, none of which boasts even half that number. The most diversified of these nations is Senegal with five crops; the least is Mauritania whose sole commercial crop is gum arabic.¹

Diversification, however, has been a mixed blessing. While it has softened the impact of fluctuating cocoa and coffee prices, it has entailed massive investment in sugar, rice and cotton, which are significantly less profitable than the more traditional exports. The estimated cost of Ivorian sugar production (including amortization and interest) is slightly over fifty cents U.S. per pound, well above current and forecast world prices. Both rice and cotton receive heavy subsidies, straining government finances. Even the oil palm sector, an early target of diversification and until recently a model of efficiency, has encountered management difficulties and sharply lower harvests, which have seriously augmented unit processing costs.

The remarkable performance of Ivorian agriculture is not confined to export crops. Food crop production has kept pace

¹These figures are from République de la Côte d'Ivoire, Ministère de l'Economie, des Finances, et du Plan, La Côte d'Ivoire en Chiffres, Edition 1979-1980 (Abidjan: Société Africaine d'Édition, 1980).

with the rapidly expanding urban population. From 1960 to 1975, the rural population grew only thirty-nine percent, yet more than doubled food production. Food imports of fifty-seven kilograms per urban inhabitant in 1975 were the lowest in recent history, and less than one-third of import levels a decade earlier. Since then, imports per urban resident have risen, but they remain substantially below the levels of the 1960s.

Except for rice, this increase in food crop production received little encouragement from the government. Instead, it is chiefly a spontaneous response to the quintupling of urban food prices since 1960. In fact, prices for food crops have increased faster than producer prices of commercial export crops. To date, private marketing channels and farming have expanded to meet increased demand. The rare food shortages in Ivorian urban centers are almost never of traditional food crops. For the country as a whole, from 1950 to 1975 staple food crop production per capita declined a negligible one percent; including imports of rice and wheat, the volume of staples available per capita rose one-half percent. In addition to starchy staples, sugar consumption increased almost seven-fold, and consumption of palm oil and beef rose significantly during the 1970s.¹

¹Calculations based on figures from République de la Côte d'Ivoire, Ministère de l'Agriculture, Statistiques Agricoles: Memento 1947-1977 (Abidjan: Imprimerie SATMACI, February 1979), pp. 7-9, 19. Population statistics are from the République de la Côte d'Ivoire, La Côte d'Ivoire en Chiffres.

Impact on Rural Population. The cumulative impact of commercial agriculture has been uneven. It has radically increased GNP, altered the regional distribution of wealth, and affected tribal and household social structures, yet it has generally left traditional farming techniques intact.

The location of the colonial trade routes and the composition of West African agricultural exports created a significant gap between the coastal forest and interior savannah regions. In the Ivory Coast, trade followed the classic colonial pattern in which the colony exchanges primary products for manufactures from the metropole. Forest perennials found a ready European market; the cereals indigenous to the savannah did not. Except for cases of localized crop failure, there was also little market within West Africa for sorghum, millet, or upland rice.

Even had European or West African tastes favored cereals grown in the savannah, overland transportation was exceedingly slow and costly. The railway linking the Ivorian savannah to Abidjan and Ouagadougou was not completed until 1954, and the savannah had few good roads. By contrast, the colonial government, aided by logging operations, early established a network of roads and railways fanning out from Abidjan. Forest crops cultivated in the surrounding region only had to be hauled overland for short distances, and utilized a relatively adequate transportation infrastructure.

The disparity between forest and savannah economies widened until the late 1960s.¹ Amin (1967) estimated that in 1950, per capita money income in the Southeastern forest zone was 6.4 times greater than in the savannah. Compared to the affluent Southeast, not only the North, but also the West and Southwest, were poor and lacked infrastructures. In 1965, average rural income in the Southwest was less than one-third of that in the Southeast. The discrepancy in rural money income was even wider: Southwestern per capita cash income was less than one-seventh of Southeastern revenue per rural inhabitant. Residents of the far western prefecture of Biankouma earned approximately one-sixteenth the money income rural inhabitants of the greater Abidjan area were making!²

The decade 1965-1975 saw significant reduction in regional income disparity. Both in terms of money income and total revenue, the ratio of wealthiest to poorest prefecture dwindled roughly forty percent over the period. The North/South disparity fell to roughly half of its 1965 level (Silue 1979). This impressive amelioration of regional income inequality was the result of: (1) government policy promoting rice and cotton in the central, west central, and northern savannah, (2) an

¹The North's only commercial crop, cotton, produced less than one percent of Ivorian export receipts until 1967.

²These figures, and those for 1975 in the next section, are calculated from data in République de la Côte d'Ivoire, Ministère de l'Economie des Finances, et du Plan, Analyse Régionale des Comptes Economiques Pour les Années 1965 et 1975, Deuxième Edition (Abidjan, Ministère de l'Economie, des Finances, et du Plan, June 1978).

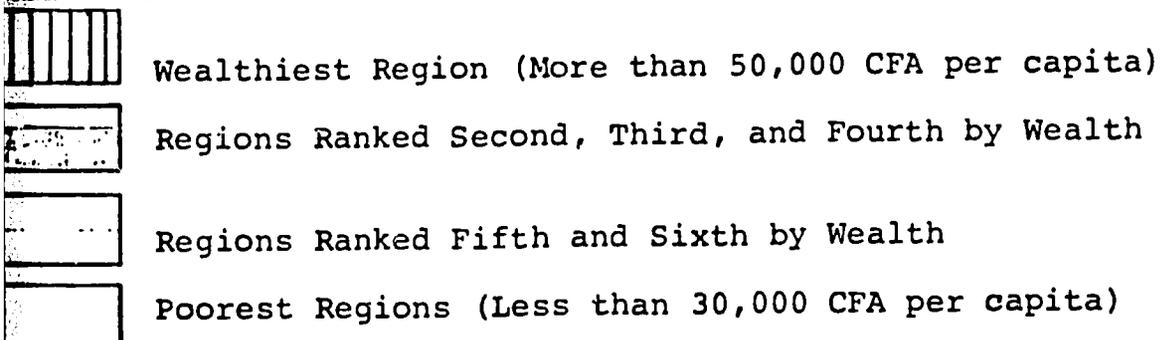
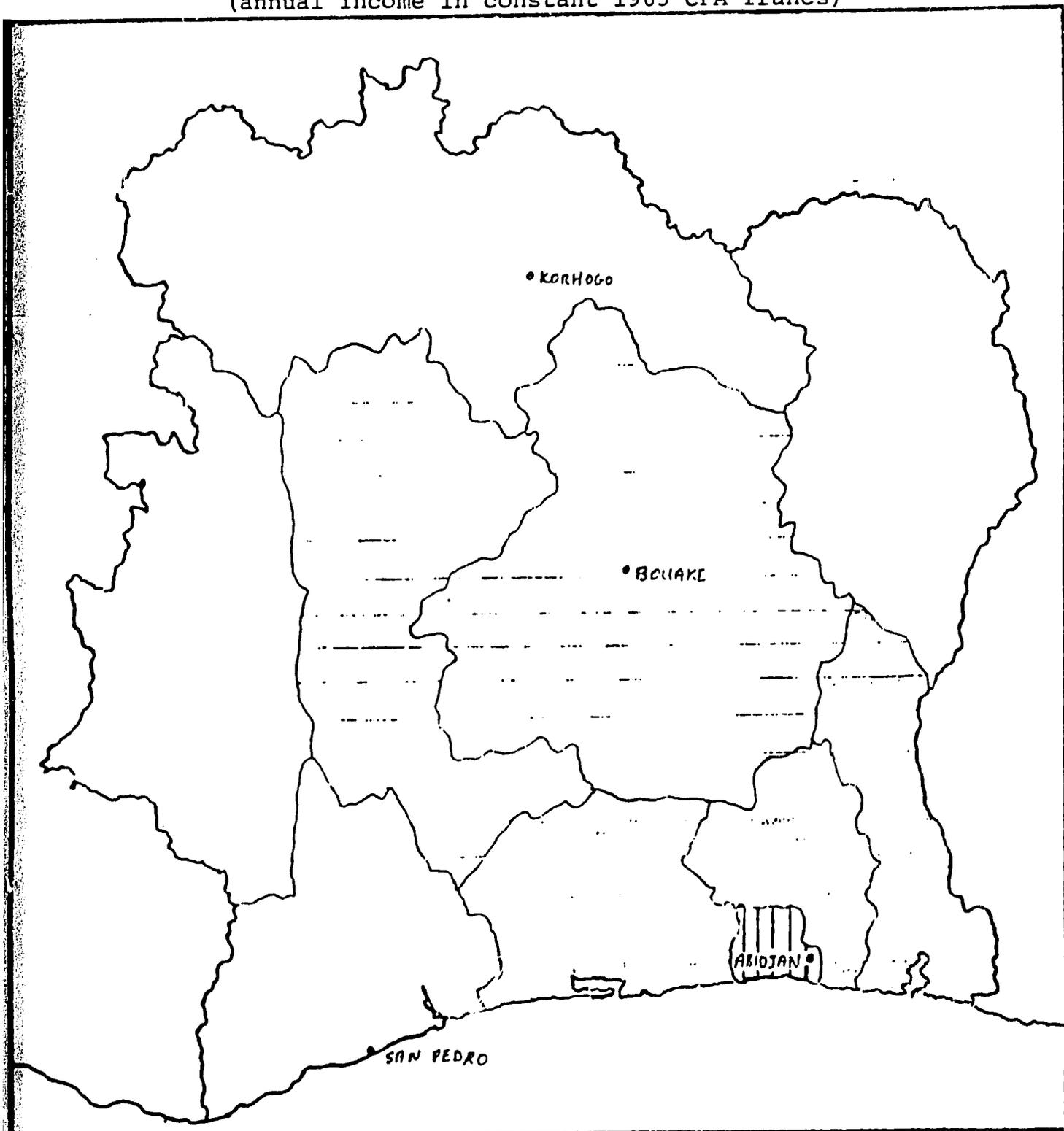
expanding radius of food crop production for the Abidjan market, and (3) continuing migration to areas with idle arable land. Despite the reduction in regional disparity, as late as 1975 the wealthiest regions still formed a compact block surrounding Abidjan, extending north to the edge of the forest zone and east to the Ghanaian border (see figure 8).

Following the introduction of coffee and cocoa, commercial agriculture transformed the traditional social systems in the forest region. Ivorians who could tap a pool of labor were able to take advantage of the abundant fertile land available, and build up large plantations. This incipient rural bourgeoisie ultimately had tremendous political significance.

In contrast to the inhabitants of the fertile Southeast, farmers in the savannah stretching across Mali, the Ivory Coast, and Upper Volta faced the combination of relatively low productivity in subsistence agriculture with an utter lack of lucrative cash crops. The disparity between possible earnings in the North versus the South produced migration to the southeastern forest, which became a flood after coffee and cocoa prices rose in the early 1950s.

The basic migratory pattern began when the indigenous people established the first plantations of coffee or cocoa. Once the plantations entered into production, their proprietors

MAP OF DISTRIBUTION OF WEALTH
 IN THE IVORY COAST 1975
 (annual income in constant 1965 CFA francs)



Source: based on data from Ministère de l'Economie, des Finances, et du Plan, "Analyse Régionale des Comptes Economiques Pour les Années 1965 et 1975," 2nd Edition (Abidjan: Ministère de l'Economie, des Finances et du Plan, 1977).

had the wherewithal to expand their plantations and hire field hands. The lure of wages plus the chance to create one's own plantation assured a supply of migrants. Initially, the migrants worked as fieldhands. Once they had amassed a stock of capital, they could establish their own plantations, while continuing to hire themselves out for short periods. When the migrants' plantations began producing, they hired their own fieldhands and the process snowballed until the supply of readily available arable land was exhausted.¹

Gastellu's (1979) study of the Moronou region in the Ivorian Southeast clearly reveals the process of proprietors tremendously expanding their holdings over time. According to local census figures, in 1954-1956, seventy-one percent of all farms were smallholdings of ten hectares or less. Gastellu's data for 1976-1977 indicate that during the approximately twenty years ensuing the original census, smallholdings had dwindled to a mere fourteen percent of the total number of farms, while the proportion of farms greater than fifty hectares rose from one percent in 1954-1956 to twenty-seven percent in 1976-1977.

The economic basis of this expansion is straightforward. Ruf (1979) calculates that a fieldhand can annually clear one

¹For a good description of this process, see Dje Assane Djeto, "Essai d'Explication de l'Implantation de la Main-d'Oeuvre Etrangère Dans le Moronou," Cahiers Ivoiriens de Recherche Economique et Sociale no. 23 (December 1979), pp. 100-101. See also Stavenhagen, "Agricultura Comercial,"

hectare and tend 2.5 hectares. Given an average harvest of either cocoa or coffee, Ruf conservatively estimates that a proprietor annually nets 75,000 CFA per fieldhand tending 2.5 hectares.¹ Clearly, proprietors had both strong motivation and the capital to augment their holdings.

The scant data available suggests that commercial agriculture has generally reinforced the importance of the husband, who cultivates only lucrative cash crops, leaving food production to his wife. As the profitability of food crops has increased, the husband has begun to grow them too, but for commercial, not subsistence purposes.²

Outside areas with extremely dense networks of extension agents, such as the Bagoué valley cotton growing region, commercial agriculture has been adopted with virtually no alteration of farm techniques. A nationwide interview survey conducted from 1973 to 1974 found that, of the peasants interviewed, seventy-two percent had never used fertilizer, seventy-four percent had never used pesticide, and ninety-one percent had never used fungicide. The vast majority of the

¹Considering inflation, producer prices, minimum agricultural wages, and yield reveals that real profits during the 1950s significantly exceeded current levels.

²République de la Côte d'Ivoire, Ministère de l'Economie et des Finances, Programme d'Action Commerciale, "Etude des Besoins des Paysans Ivoiriens et des Actions à Entreprendre Pour les Satisfaire" (Suresnes, France: IDET-CEGOS, 1974).

farmers continued to rely upon the machete, daba, knife, and axe.¹

This pattern holds even in the Southeast. Guike (1975) found that in spite of a long history of cocoa and coffee cultivation, Attie farmers in the Alépé area northeast of Abidjan continued to utilize archaic tools because they were easy to manipulate, even if they made the job longer. Virtually no farmers applied fertilizer to food crops, and they had no notion of either soil management or yield.

In fact, yields per hectare of coffee and cocoa in the Ivory Coast are extremely poor and have stagnated during the last three decades. Compared to other major producers, Ivorian cocoa yield per hectare is among the lowest; Ivorian coffee yield per hectare is the absolute lowest by a widening margin. The tremendous expansion of Ivorian smallholder agriculture--export and food crops--occurred by bringing into production a previously idle resource (land), and transferring labor from the less productive savannah to the more fertile forest. There was little modernization of forest agriculture, simply an extension.²

¹Ibid.

²For an interesting statistical analysis of production, hectarage, and yield from 1947 to 1977, see Eddy Lee, "Export-Led Rural Development: The Ivory Coast," World Employment Program Research Working Paper 10-6/WP32 (Geneva: International Labour Office, January 1980). Two notable exceptions to the stagnating yield are rice and cotton (which Lee does not analyze).

VII. THE ROLE OF THE STATE
IN IVORIAN DEVELOPMENT

A. The Doctrine of State Capitalism

Since independence, the Ivorian government has faced a dilemma. Espousing liberal capitalism and committed to rapid economic development, it has confronted a domestic private sector deficient in capital and skills. In its drive to accelerate economic growth, the government has massively intervened in the economy. To justify this paradox --a liberal capitalist state directly involved in private sector activities-- Houphouët Boigny evolved the doctrine of capitalisme d'Etat (state capitalism). Capitalisme d'Etat maintains that the role of the state is to nurture, facilitate, organize, and control the private sector. Until the private sector matures, the state also carries out key investments.¹ President Houphouët Boigny articulated this

¹The reader interested in the development of capitalisme d'Etat should consult: Michel Mayor, "Le Capitalisme d'Etat en Côte d'Ivoire" (Law thesis, University of Lyon, 1969); Michel Bernard, "Les Entreprises Publiques en Côte d'Ivoire," Bulletin de la Banque Centrale des Etats de l'Afrique de l'Ouest, issues no. 170 (February 1970) and no. 174 (June 1970); Francis Parot, "L'Enterprise Publique, Instrument de l'Intervention Economique de l'Etat en Côte d'Ivoire" (Doctoral thesis, Université de Bordeaux I, 7 December 1976); and Jacqueline Dutheil de la Rochère, L'Etat et le Développement Economique de la Côte d'Ivoire (Paris: Editions A. Pedone, 1976).

credo with particular clarity in a speech he delivered to the Assemblée Nationale in 1965:

In order to create 36,000 hectares of oil palm with the assistance of the Common Market, the state will be responsible for carrying out the project. It is understood, however, that the Ivory Coast is not a socialist country and its government will not hoard the project's profits. Thus, once the 36,000 hectares of oil palm are planted, we will distribute them to peasants in units of two to three hectares apiece. These peasants will be full proprietors of this land which their children will inherit...In the same way, the Ivory Coast as a state capitalist participated in the construction of the Hotel Ivoire. In ten years, the state will be the sole proprietor of this hotel. We will then give it to Ivorians --individuals or cooperatives--who will manage the hotel themselves. They will gradually buy out the government's share and will ultimately become full owners...Thus, the Ivorian state is a capitalist in the noblest sense of the word: it engages in capitalism without retaining the fruits of its labors; it gives up its share in order to help its children avoid difficulties in their investments.¹

Specific motivations impelling state intervention in the economy can be classed into six categories. First, the government has intervened in order to control the growth and operations of strategic infrastructures (e.g. transportation, communication, education and research, utilities). Second, the state regulates and organizes existing economic sectors by providing an acceptable base-line of services to which the private sector must conform (e.g., rural PAC shops, producer prices for cash crops, state banks providing rural credit).

¹Speech by Houphouët Boigny to the Assemblée Nationale on 11 October 1965; c.f. Bernard "Entreprises Publiques," pp. 2-3. Freely translated by the author.

Third, the state undertakes investments exceeding the resources of the domestic private sector (e.g., palm and sugar agro-industrial programs). Fourth, it ensures that investment and incomes are distributed equitably between regions (e.g., heavy subsidization of cotton and sugar programs in the savannah), and between urban and rural areas. Fifth, the government provides services increasing public welfare, such as urban public transportation and rural water supply. Last, it ensures that the overall structure of the economy is satisfactory: strong export promotion and import substitution, and a diversified industrial and agricultural base.

Parastatals have emerged as the premier organizational tool for this state intervention. They permit direct government involvement in the economy without creating a huge civil service bureaucracy. Structured and staffed to a large extent along the lines of a private enterprise, parastatals have at least the potential to operate with great efficiency and flexibility. In addition, they have been useful in attracting foreign capital and expertise. Foreign donors of development assistance frequently prefer that an identifiable specialized agency implement their projects. In some cases, loans have been contingent on private sector participation in a project. Private enterprises reluctant to take on the risks inherent in operations in a developing nation have been persuaded to invest in joint ventures (sociétés d'économie mixte) with the government. Once parastatals became a widely accepted

organizational form, they were used as the solution to a tremendous array of administrative problems. Parastatals are now active in virtually every sector of the Ivorian economy.

B. The Growth of the Parastatal Sector

At the time of independence in 1960, the Ivory Coast boasted two state corporations (SATMACI and CCI), fourteen private enterprises in which state held equity, and three public agencies (the CAA, CECI, and ASECNA).¹ By the end of the 1960s, there were twenty state corporations, sixteen joint ventures, fifty-three private corporations or partnerships with some public equity, and eleven public agencies or régies. The number of parastatals had quintupled in less than a decade.

The last official exhaustive survey of the parastatal sector was carried out in 1977.² It lists fifty public agencies

¹The legal categories of "joint-venture" and "régie" were not yet formalized or utilized. The fourteen private enterprises with state participation in their equity were: SECI (1959), EECI (1952), SAPH (1956), SACO (1956), SOTRA (1960), SIDELAF (1959), SIFERCOM (1956), SODECI (1959), SOTROPAL (1959), CAPRAL (1959), ERG (1919), PHCI (1954), SALCI (1959), and SOHICO (1959). The list is culled from: Jean Grosdidier de Matons "Dix Ans d'Evolution des Etablissements Publics en Côte d'Ivoire," Penant no. 728 (April/May/June 1970), pp. 153-180; Bernard, "Entreprises Publiques;" and Parot, "Entreprise Publique."

²République de Côte d'Ivoire, "Repertoire des Etablissements Publics et Sociétés à Participation Financière Publique," Vol. 1 "Classification et Conditions de Tutelle" (Abidjan, République de Côte d'Ivoire, June 1977).

and régies, thirty-four state corporations, and one hundred and seventy corporations in which the state held direct or indirect equity. The grand total was two hundred and fifty-four parastatals: over ten times the number in 1960. Subsequent studies indicate that since 1977 the parastatal sector's growth has slackened. An unofficial government report in May 1980 listed fifty-one public agencies and régies, but only twenty-seven state corporations. There is no recent survey of the entire gamut of state investments in private corporations and joint ventures.

The most recent reliable financial data for fiscal year 1978 show the continued importance of the parastatal sector.¹ Ranked in terms of value-added, parastatals comprised all of the top five enterprises, nine of the top ten, and nineteen of the top thirty. Despite a highly restrictive definition of mixed enterprise that eliminates ninety-five percent of private corporations with state equity, the Centrale de Bilans 1978 found the parastatal sector accounted for twenty-three percent of national employment, forty-four percent of all corporate assets, and eighteen percent of gross value-added.

C. Legal History

Ivorian parastatals trace their legal origin to a French

¹R.C.I., Ministère de l'Economie, des Finances, et du Plan, Banque de Données Financières, Centrale de Bilans 1978 (Abidjan: Société d'Imprimerie Ivoirienne, 1979).

law enacted in 1946 that codified the wartime emphasis on national economic planning in the metropole and the overseas empire (la France d'Outre Mer). To help formulate and execute ten-year development plans in the colonies, the Ministre de la France d'Outre Mer was given the authority to create public corporations which would function "with the techniques and flexibility of private commercial and industrial enterprises..."¹ Although three Ivorian public corporations (including SATMACI) were established according to this French legislation prior to the Ivory Coast's independence, the parastatal sector did not begin to flourish until the Ivorian laws of 1962 and 1963 firmly placed public corporations and joint ventures in the arsenal of organizational forms available to implement government projects.²

Juridically, there are six species of parastatals. Listed in order of increasing private sector activity, they are:

1. Régies (autonomous administrative services)
2. Etablissements public à caractère administratif
(public administrative agencies)
3. Etablissements publics à caractère industriel et commercial
(public industrial and commercial agencies)
4. Sociétés d'Etat (state corporations)
5. Sociétés d'économie mixte (joint ventures)
6. Sociétés anonymes and Sociétés à responsabilité limitée
(private corporations and partnerships)

¹These public corporations are called "sociétés d'Etat" in the legal texts. The quotation is from Article II of the law of April 30, 1946, translated by the author. For a fuller quotation, see Bernard, "Entreprises Publiques," p. 9.

²For state corporations, see Law 62-82 of 22 March 1962, in JORCI (5 April 1962):378; Law 63-22, article 12, of 5 February 1963, in JORCI (6 February 1963); and Law 63-277 of 12 June 1963, in JORCI (27 June 1963):753. For joint ventures, see Law 62-255 of 31 July 1962, in JORCI (5 August 1962).

Régies are public services whose budget is listed as an annex to the main government budget. Primarily involved in transportation and communications, Ivorian régies include the RAN railway, the Ports of Abidjan and San Pedro, the postal and telecommunications service, the television and radio agency, the national press agency, and the national cinema agency. All of these (except the RAN and the Port of San Pedro) were établissements publics when first created during the period 1960 to 1962, and were transformed into régies during 1963-1966. The activities of these autonomous administrative services are largely peripheral to the agricultural sector, and therefore the category "régie" is generally excluded from discussion of agricultural parastatals.¹

The five remaining categories of parastatals are imperfectly specified and overlap one another. The confusion this vague legal framework engenders is exacerbated by the fact that a number of important parastatals are arguably classified in the wrong legal category. In part, this represents flexible and pragmatic government action unhindered by legal pedantry. However, the ad hoc and disjointed nature of the parastatal sector's legal basis handicaps the government's efforts to improve parastatals' efficiency, and to

¹For a detailed discussion of Ivorian régies and établissements publics, see Grosdidier de Matons, "Établissements Publics."

coordinate their activities and finances.

Beginning with ideal types, public agencies (établissements publics) of all ilk possess no equity capital and obtain their revenue in the form of a budget allocation from the central government. Public industrial and commercial agencies assist industry and commerce, chiefly by providing financial infrastructure (e.g., stock exchange, chamber of commerce) and technical assistance. Public administrative agencies undertake cultural missions, engage in education and research, and administer funds for national development.

State corporations possess equity, which is fully public; they are to some extent self-financing. In general, they are responsible for implementing a specific government program, usually one with significant social welfare aspects. Most of the Ivorian government's agricultural policy is executed by state corporations.

Joint ventures, established by the Ivorian state and the private sector, function basically as private corporations. Unlike régies, public agencies, and state corporations, joint ventures are subject to commercial law. They are self-financing, and expected to make profits. The government exerts surveillance and control proportionate to its share of corporate equity.

In addition to formal joint ventures, the state has invested directly and via existing fully public parastatals in

a wide variety of private corporations and partnerships. These investments leave intact the previous legal framework of the enterprise. The government holds the rights of any stockholder, no more.

The Ivorian parastatal sector teems with exceptions to these ideal types. Although research and training institutes in principal fall under the rubric of public administrative agencies, the ONFP is a public industrial and commercial agency and ITIPAT is a state corporation. Two major organizations, respectively in charge of stabilizing the prices of domestic staple foods (CCPPPGC) and the commercialization of rice (OCPA), whose annual budgets add up to between five and ten billion CFA, have no legal existence whatsoever!

Contrary to the ideal types, a number of régies and public agencies are significantly self-financing (CAA Depôts, Caisse d'Epargne, IGCI, Imprimerie Nationale, RAN, OPT, the Port of Abidjan, and the Port of San Pedro), whereas several state corporations are utterly dependent on government funds (SODEFOR, FOREXI, SETU, SODEMI, ARSO, and the AVB). Although the letter of the law requires that state control of joint ventures be proportionate to the percentage of equity held by the public, many ventures between fully public parastatals (notably the CSSPPA and SONAFI) and the private sector are subject to virtually no government supervision. Indeed, the law itself is equivocal: it decrees that state (or parastatal)

participation in joint ventures engenders state control, whereas state (or parastatal) investment in private corporations does not.¹ As a result, the level of government technical and financial surveillance and control bears little relation to the percentage of public equity.²

Since the initial legislation of 1962, the government has carried out several reforms of parastatal legislation in order to: (1) simplify and clarify the legal statuses of the different types of parastatals; (2) tighten government control over parastatal decisionmaking, finances, and personnel policy; and (3) increase the sector's efficiency. The results of the successive reforms have been mixed. The simple fact that the legal framework governing state corporations and joint ventures has been repeatedly transformed generates confusion. For example, state corporations were subject to civil law from 1962 to 1966, to commercial law from 1966 to 1970, and thereafter subject to civil law once

¹This legislation is contained in the reform of 1970: Law 70-633, article 8, of 5 November 1979, in JORCI (19 November 1970), p. 1879. The law is, in fact, a tautology: the only way to determine whether or not government investment in an enterprise implies public participation is to verify whether or not the enterprise in question has altered its management to conform with the laws governing state participation. If it has altered its management, then the corporation has become a joint venture. If it has not altered its management, then the government is merely judiciously investing public funds in a likely enterprise.

²Furthermore, a joint venture between the Ivorian public sector and another public institution is legally not a joint venture at all: it is, instead, a state corporation.

again.

The first sweeping reform, enacted in 5 November 1970, restructured the parastatal sector without simplifying the confusion.¹ State corporations were defined as "public and commercial establishments" with no reference to their social welfare missions. Moreover, they were lumped together with public industrial and commercial agencies that, unlike state corporations, hold no equity.² The reform applied to new joint ventures but left intact the legal bases of existing joint ventures, creating an even greater potpourri than before. Subsequently, the government judged that under the 1970 reforms the control and surveillance of top management, decisionmaking, finance, and personnel policy was unacceptably lax. New legislation promulgated in 1972 imposed strict and cumbersome state controls on parastatal decisionmaking, and drastically reduced the remuneration and perquisites of parastatal employees. Before the 1972 reform, employees had enjoyed salaries that if anything exceeded those in the private sector, combined with the job security and retirement benefits offered by the public sector. The reform cut job security and retirement benefits by placing parastatal personnel squarely under the auspices of the private sector employment code, while simultaneously pegging parastatal salaries to the

¹Law 70-633 of 5 November 1970; in JORCI (19 November 1970), p. 1879.

²See Dutheil de la Rochère, L'Etat et le Développement, pp. 68-72.

levels of the public sector (which were approximately twenty percent below private sector remuneration). Even more than the radical tightening of state control the 1972 reform implied, its Draconian personnel measures sparked intense parastatal resistance.¹ Ultimately, Houphouët Boigny quietly suspended the 1972 legislation before it was ever enforced. A review of the parastatal sector ensued, culminating in the Laugier report and the 1973 Seminaire de Yamoussoukro. The report criticized the parastatal sector for poor management, irresponsible expansion of financial commitments and staff, and a virtually categorical failure to remain within budget.² The 1973 consultations in Yamoussoukro laid the groundwork for a major reorganization of the parastatal sector in 1975. This reform applied to all enterprises in which the state financially participated (i.e., excluding investments as opposed to participation). The 1975 reform remains in effect and thus merits a

¹Before the abortive 1972 reform, and until the 1975 reform was accepted, the personnel code governing a parastatal employee was a function of the employee's origin (government bureaucrat, expatriate, private sector, military, etc.) and not of the institution in which the employee worked. People working in the same job in the same institution received considerably different salaries and benefits. In general, salaries were significantly higher than in the public service. For a detailed history and discussion see Patrick Picard, "Les Agents de l'Administration et les Entreprises Publiques en République de Côte d'Ivoire" (Dissertation for Doctorat d'Etat en Droit, University of Lyon, 1977).

²For an account of the "Rapport Laugier" see Fraternité Matin (26 January 1973).

detailed exposition.¹

D. The Current Legal Framework

The objectives of the 1975 reform were threefold. The government wanted to: (1) control and coordinate the broad policy decisions and the financial obligations of the various parastatals, (2) revise and systematize the welter of personnel codes, while nevertheless (3) leaving the parastatals sufficient independence to effectively accomplish their missions.

The reform significantly strengthened the Minister of Economy and Finance by placing under his auspices the department of state participation management (Direction des Participations). This department is the staff support of the reform. It gathers and analyzes information on all parastatals.

The Minister of Economy and Finance participates as primus inter pares in the Interministerial Supervisory Committee (Comité Interministeriel de Tutelle) which includes all ministers responsible for technical supervision of parastatals, as well as the Minister of Planning and the Minister of Economy and Finance. This collegial organ is the apex of the new structure. The Interministerial Supervisory

¹The reform consists of three decrees, 75-148, 75-149, and 75-150 of 11 March 1975, in JORCI (1975), pp. 777-778, 781.

Committee (ISC) sets policy for the parastatal sector as a whole. It proposes chief executive officers (directeurs généraux) of the state corporations to the Council of Ministers; it names the members of the state corporations' boards of directors (conseils d'administration); and it reviews the performance of state corporations. Any financial action that reduces the proportion of state equity in a joint venture requires the ISC's previous approval.

The day to day implementation of the ISC's rulings is the responsibility of seven sectorial committees (SC) (comités sectoriels). Each SC is composed of representatives from the Ministers responsible for the economic sector in question and of professionals in that sector. Committee members can serve on only a single SC at any one time, in order to ensure that they devote sufficient time to their obligations. The SCs formulate position papers for and execute the decisions of the ISC regarding all parastatals in their sector.

Several types of direct control are exerted over parastatals. The representatives in the SCs of the Ministers responsible for a given sector are automatically members of the boards of directors of all the state corporations and of all joint ventures whose public equity exceeds one-third in the sector. These representatives are responsible for ensuring sound management. In state corporations, they have the right to investigate any aspect of the corporation and have access to all documents. They can suspend the chief executive's

decisions for up to one month in order that the board of directors review and approve the decision. They can also propose the dismissal of the chief executive officer (CEO) to the ISC. In joint ventures, they are responsible for the soundness of the budget, and must receive the results of the past budget and proposals for the next budget and multi-year plan at least one week before the board meetings in which these issues are reviewed.

State control over persons in state corporations (i.e., choice of CEO and members of the board of directors) is complemented by control over corporate activities. The SCs submit quarterly reports on each state corporation to the ISC, and corporate accounts are periodically audited. In theory, the Chambre de Comptes of the Supreme Court maintains continuing financial surveillance over all state corporations; in practice it has never had the capability to do so.

The Government controls in various ways joint ventures whose state participation in equity exceeds one-third. The ministers in charge of overseeing the enterprise must approve the board of directors' choice for CEO and for chairman of the board. The venture must submit for approval to its Sectorial Committee all requests for: public credit, state guarantees on financial transactions, obtaining funds from foreign sources, and hiring outside auditors.

To counterbalance stringent controls on state corporations, the government has somewhat strengthened the role of the board

of directors. In order to eliminate lackadaisical participation, membership is restricted to a maximum of fifteen, and at least two meetings a year are required. The board ratifies the supervising Minister's choice for chairman of the board, sets its own rules of order, can appoint a secretary, and can bring in outsiders for consultation at its own discretion.

The 1975 reform also systematized personnel policy and brought it under state control. It offered a very clever package that maintained remuneration and benefits approximately at existing levels (especially for the top cadres responsible for implementing the reform) while explicitly denying employees the status of civil servants. In fact, the policies on recruitment, promotion, vacation, discipline, employee obligations, and dismissal are very similar to those in the civil service code. An interesting innovation is the institution of quarterly productivity bonuses, each of which can reach up to half of an employee's monthly paycheck. The total of these bonuses cannot exceed a purposely low ceiling, which ensures that each parastatal will only be able to give a fraction of its employees the full bonus.¹

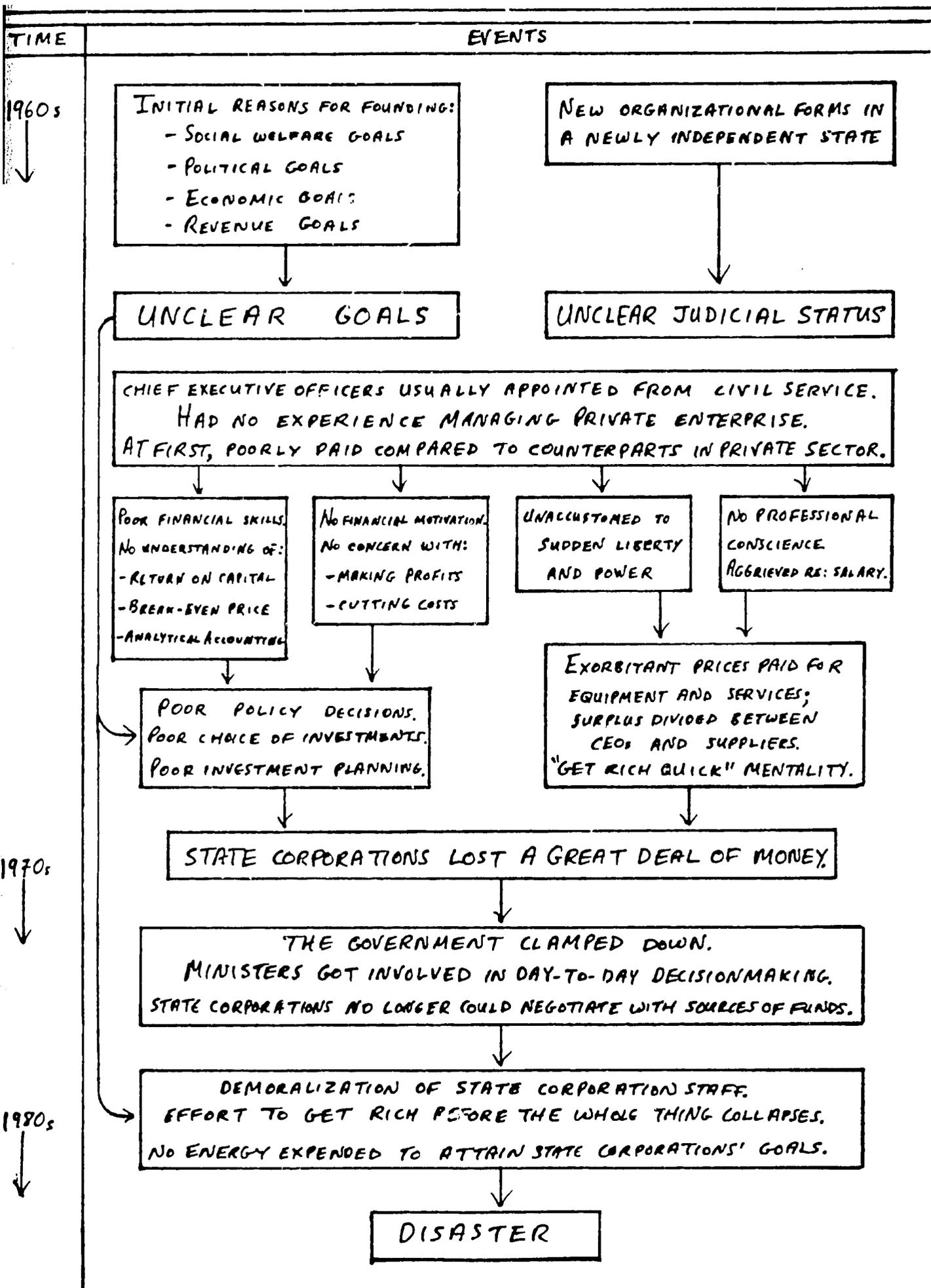
Evaluating the impact of the 1975 reform, it is clear that the government has significantly augmented its control

¹For a fuller discussion, see: Picard, "Agents de l'Administration;" and Dutheil de la Rochere, L'Etat et le Développement, pp. 91-92.

over state corporations. By doing so, it has ensured that: (1) these corporations no longer function as independent duchies pursuing their own missions to the detriment of a national program of development, and (2) the corporations often lack the financial and managerial independence needed to efficiently execute their missions. The post 1975 expansion of borrowing from domestic banks at high rates of interest (the only source of credit that does not require prior approval from the central government) indicates parastatals' desperate search for some autonomy.

The flow chart (figure 9) on the following page portrays the past development and a possible future of the Ivorian parastatal sector. Although the flow chart is, in the author's opinion, overly pessimistic, it emphasizes a number of key problems.

FIGURE 9
PAST AND POSSIBLE FUTURE EVOLUTION
OF THE IVORIAN PARASTATAL SECTOR



SOURCE: ADAPTED FROM AN UNOFFICIAL DOCUMENT OF THE IVORIAN GOVERNMENT.

VIII. STATE INTERVENTION IN AGRICULTURE

A. The Central Administration

The institutional history of the agricultural sector is one of political turmoil in the early 1960s followed by accelerating diversification and fragmentation of authority in the late 1960s and early 1970s. Since then, the government has sought to systematize and coordinate the multitude of organizations, but has only achieved partial success in this endeavor.

In January 1963, the Minister of Agriculture, Charles Donwahi, was arrested for treason. His replacement, Jean Mockey, returned in February from political exile to fill the vacated post. Mockey, Houphouët Boigny's most formidable political rival, was himself arrested only months later along with six other ministers for plotting a coup d'état. From late 1963 until 1966, President Houphouët Boigny personally took charge of the Ministry of Agriculture, as well as the Ministry of Economy and Finance, and the Ministry of Planning. It was not until 1966, when the President cautiously appointed a Delegate Minister of Agriculture (Abdoulaye Sawodogo), that the ministry returned to anything approaching an even keel. Sawodogo carried out his duties with impressive competence for over a decade. He was finally succeeded in 1977 by

Joachim Porquet, then director of SATMACI, who currently holds the office.

As the turmoil of the early 1960s subsided, several powerful organizations joined the central administration of the agricultural sector. In 1966, the government established the Ministry for Livestock.¹ In 1969, the government created agencies responsible for the regional development of the Bandama Valley (AVB) and the Southwest (ARSO). The AVB and ARSO coordinate their activities with the Ministry of Agriculture, but formally report directly to the President. In 1971, two further ministries made their appearance: the Ministry of National Parks, and the Ministry of Forestry and Water Resources.

Currently, the Ministry for Scientific Research holds responsibility for the agricultural research institutes, and the Ministry of Commerce controls the CCPPPGC which stabilizes domestic rice and sugar prices. In addition, the Ministry of Agriculture administers the National Office for Rural Development (ONPR) jointly with the Ministry of Planning, and administers the Stabilization Fund for agricultural exports (CSSPPA) jointly with the Ministry of Economy and Finance. Seven ministries (plus the Presidency) are now involved in the agricultural sector.

¹The Ministère Pour la Production Animale was independent until the 1963 attempted coup, when it was combined with the Ministry of Agriculture until 1966.

The Ministry of Agriculture itself executes virtually no programs. Instead it oversees the host of parastatals charged with implementation. In 1977, the Minister of Agriculture noted that ninety-four percent of the personnel under the Ministry's auspices were employed by parastatals-- only six percent worked directly for the Ministry.¹

B. The Implementing Institutions

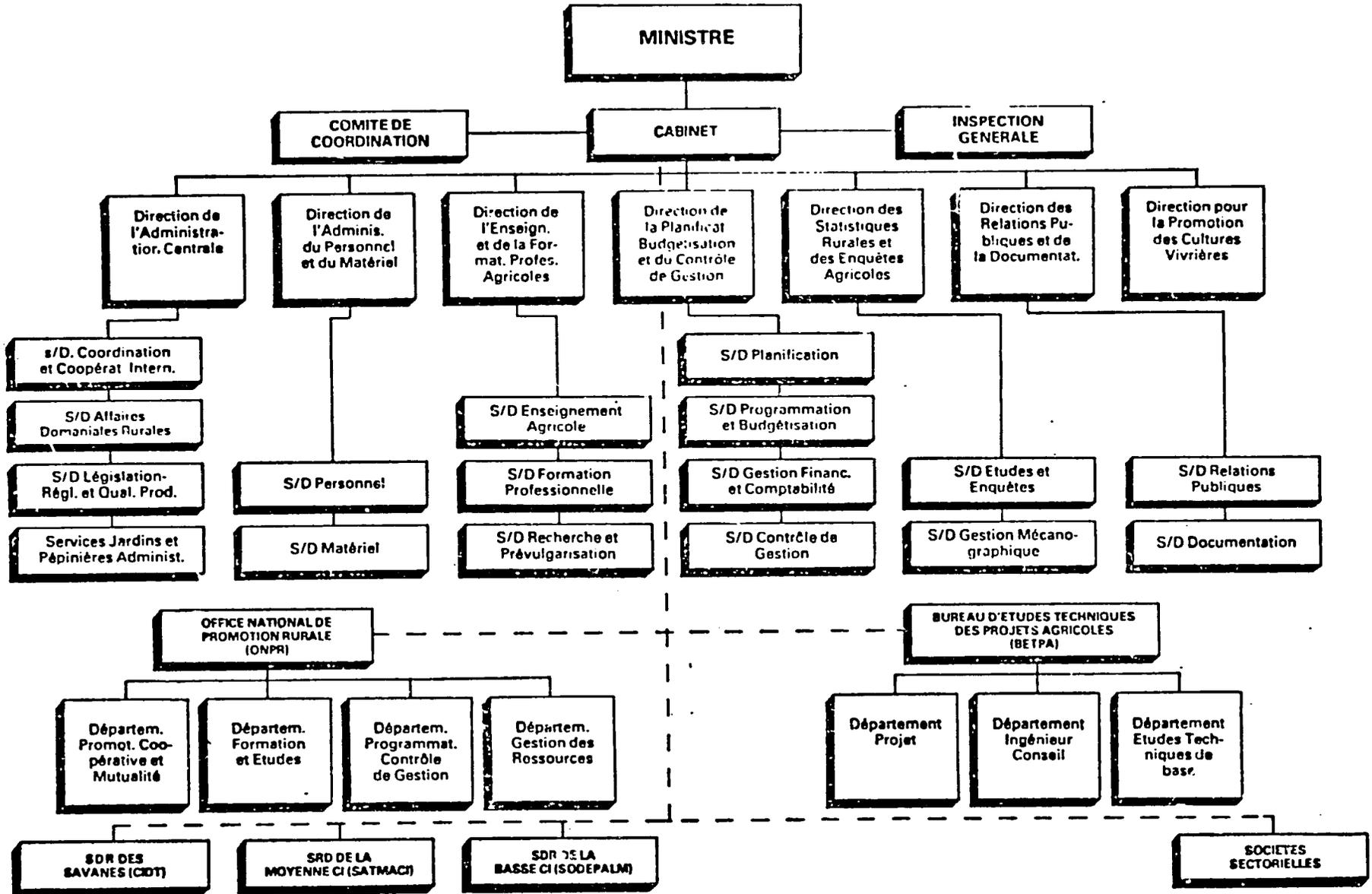
State corporations directly supervised by the Minister of Agriculture and responsible for one or several crops have dominated agricultural development: SATMACI (coffee and cocoa), SODEPALM (oil and coconut palm), SODESUCRE (sugar), CIDT (cotton),² and SODEFEL (fruit and vegetables). Formerly, SODERIZ handled rice while SODHEVEA and its successor SOCATCI were in charge of natural rubber production.³ Complementing

¹République de Côte d'Ivoire, Ministère de l'Agriculture, "Seminaire Sur la Reforme des Structures du Ministère de l'Agriculture" (Yamoussoukro: République de Côte d'Ivoire, 10-12 November 1977).

²The CIDT is a joint venture between the Ivorian government and a French parastatal, the Compagnie Française pour le Développement des Fibres Textiles.

³Now, rice production is the purview of SATMACI, SODEPALM, and the CIDT, while rice processing and marketing are the responsibility of a shadowy agency with no legal existence: the Office pour la Commercialisation de Produits Agricoles. Joint ventures (notably the SOGB) are undertaking the production of natural rubber in industrial plantations.

FIGURE 10
 ORGANIZATIONAL CHART OF THE
 MINISTRY OF AGRICULTURE 1980



these crop-oriented parastatals is a state corporation for the mechanization of agriculture (MOTORAGRI), responsible for heavy earthmoving throughout the Ivory Coast.¹

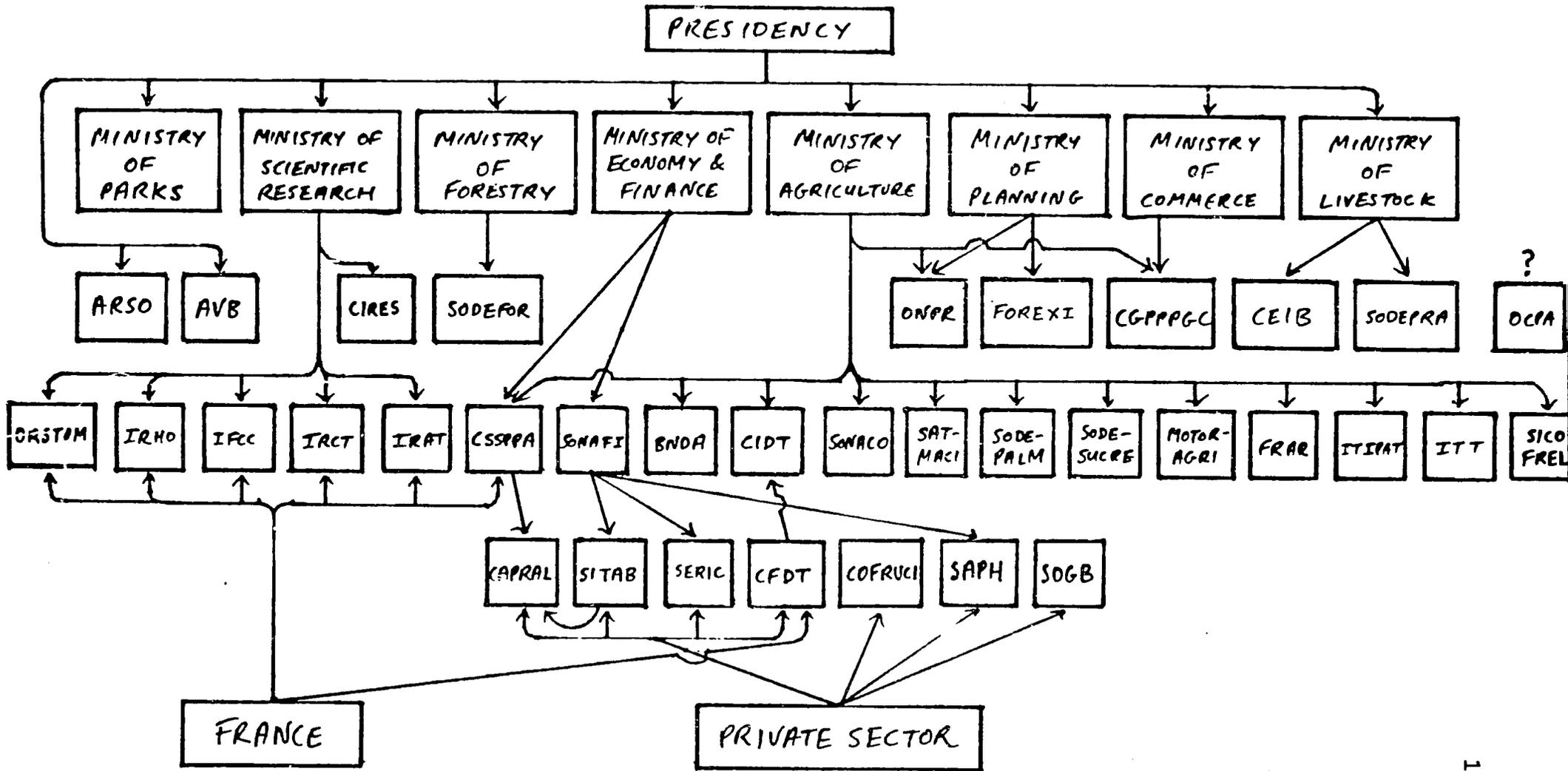
These parastatals' mandates are extremely heterogenous. SATMACI, for example, is concerned only with agricultural production; while SODEFEL and SONACO concentrate almost exclusively on marketing. By contrast, the CIDT, SODEPALM, SODESUCRE, and the erstwhile SODERIZ are involved in production, farm-gate purchasing, and processing. The CIDT and, until the late 1970s, SODEPALM also handled international sales of their processed cotton and palm products.

A variety of parastatals support these agricultural state corporations. Tobacco is processed into cigarettes and cigars and marketed by SITAB, a private corporation with some public equity. COFRUCI, a fully private corporation, exports fresh pineapples, while SERIC, a joint venture, and CAPRAL, a private corporation with some public equity, are involved in the processing and marketing of coffee and cocoa. Until its liquidation in 1980, a state corporation (AGRIPAC) domestically marketed fruits and vegetables. Most agricultural research is carried out by several French institutes under the supervision of the Ministry of Scientific Research. They have conducted valuable investigations on coffee and cocoa (IFCC), cotton (IRCT),

¹Livestock programs are implemented by SODEPRA and the CEIB, both under the auspices of the Ministry of Livestock.

FIGURE 11

INSTITUTIONS INVOLVED IN THE AGRICULTURAL SECTOR
OF THE IVORY COAST--1990



ARROWS INDICATE THE DIRECTION OF EQUITY INVESTMENT AND/OR AUTHORITY.
SOURCE: COMPILED BY THE AUTHOR.

and oil palm (IRHO); but have done less successful work on food crops (IRAT). In addition, ITIPAT, a state corporation, and the Institute of Tropical Technology (ITT) carry out agro-industrial research.¹

Three parastatals provide financing for the agricultural sector. The National Agricultural Development Bank (BND) makes short-term low interest loans directly to farmers and also via other parastatals. These are chiefly used to tide farmers over until the harvest. The CSSPPA provides several parastatals with substantial funds (e.g., SODEPALM, SATMACI) for operating and investment costs. The FRAR (Regional Rural Improvement Fund) stimulates grassroots rural development by paying up to eight-five percent of the cost of locally initiated projects for roads, water supply, and other social infrastructures.

Rural social development is the responsibility of the National Office for Rural Improvement (ONPR), jointly overseen by the Ministry for Agriculture and the Ministry of Planning. Until its recent liquidation, CENAPEC was responsible for creating cooperatives throughout the Ivory Coast. Although the monetary attraction of coffee and cocoa cooperatives led to their rapid spread, CENEPEC failed to create a "cooperative spirit" among the peasantry and was liquidated. Figure 11

¹The ITT is the research wing of the former SODEPALM conglomerate.

shows the major institutions involved in the agricultural sector of the Ivory Coast in 1980.

Given the welter of institutions involved in Ivorian agriculture, a useful index of the government's priorities within the agricultural sector is the bottom line: the amount the government has expended on each of its many agricultural programs. Although it did not attain major proportions until the second half of the decade, spending on oil palm was the government's largest investment of the 1960s. During the four year period 1967-1970, expenditures on oil palm comprised forty-five percent of all government agricultural investment. Rice, the second priority over this period, received seventeen percent, followed by cotton (ten percent) and cocoa (eight percent).

During the subsequent decade, 1971 through 1980, real government expenditure was more evenly balanced. Sugar projects received the largest share: twenty-one percent.¹ Eleven percent was allocated to the oil palm sector, eight percent apiece to cotton, rice, and regional projects, and seven percent to cocoa. (See table 5). In contrast to the previous decade, about half of all agricultural investment was in the savannah zone.

¹This figure is a World Bank estimate. Official government figures are considerably higher.

TABLE 5

PUBLIC SECTOR INVESTMENT IN AGRICULTURAL SECTOR
 UNDER THE 1971-1975 AND 1976-1980 PLANS
 (billions of constant 1975 francs)

Crop	Plan 1971- 1975 ^a	Plan 1976- 1980 ^b	Total 1971- 1980	Percent of 1971- 1980 Agricultural Investment	Rank 1971- 1980
Sugar	40.2	40	80.2	21%	1
Oil palm	28.4	11.2	39.6	11	2
Cotton	2.9	28	30.9	8	3
Regional Projects	13.9	16.8	30.7	8	4
Rice	15.4	14.6	30.0	8	5
Cocoa	12.0	15	27.0	7	6
Forestry	6.9	20	26.9	7	7
Rubber	10.0	13.8	23.8	6	8
Livestock	8.0	15	23.0	6	9
Coffee	11.3	6	17.3	5	10
Coconut	7.7	6.1	13.8	4	11
Fisheries	2.1	5	7.1	2	13
Vegetables	1.0	6	7.0	2	14
Kenaf	2.6	----	2.6	1	15
Fruits	2.2	n.a.	2.2	1	16
Parks	1.4	n.a.	1.4	---	17
Other	1.2	10	11.2	3	12
Total	167.2	207.5	374.7	100	

^aThe coefficient used to correct for inflation 1971-1975 was 1.51.

^bWorld Bank estimates.

Source: World Bank, Ivory Coast, pp. 417, 419; tables SA79, SA81.

C. Incentives and Farmer Decisionmaking

In addition to direct intervention through institutions and investments, the government has exerted control over the agricultural sector by manipulating price incentives. Policies using producer prices and planting subsidies rely on a decentralized market mechanism: thousands of individual farming households. Given the virtual absence of studies on agricultural decisionmaking in farm households in the Ivory Coast, this paper must depend upon rough approximations to estimate the impact of price policy on production. The decisionmaking unit used for analysis will be a unified farm household. This is a double simplification, since interests may diverge between members of a household (e.g., male versus female), and additional social units may participate in agricultural decisionmaking (e.g., clan, tribe).¹ The two most important decisions are: the selection of crops to plant, and the decision to tend and harvest the planted crops.

Two common models describe farmers' decisions to plant and tend cash crops: cost/benefit analysis and annual net

¹The only research that directly investigates Ivorian agricultural decisionmaking units is J. Dirck Stryker's study of a tribe in the savannah zone. Stryker found three levels of decisionmaking: the chief, the clan head, and the household head.

Cleave, "Decisionmaking," summarizes several West African cases in which the interests of female members of the farm household diverged to such an extent from those of the male members that seemingly feasible technical packages were unworkable.

revenue. Both provide a quantitative method of assessing the relative advantage of various crops and technical packages. The chief difference between the approaches is that cost/benefit analysis discounts and sums future benefits and costs, while annual net revenue considers only a single representative year during which the crop is in full production.

Although the data is limited, annual net revenue seems the more useful tool: it is simpler than cost/benefit analysis and a closer approximation to farmer decisionmaking.¹ Pillet-Schwartz (1973:174-6) interviewed ninety-five oil palm farmers in the Ivory Coast. The farmers' responses indicate a general lack of the information and analytical viewpoint required to carry out even rough cost/benefit analysis. Some did not know that oil palm produced no fruit during the first four years; many had no idea of when their plantation would become profitable. Without this temporal data, cost/benefit analysis is impossible. Even farmers who must know from experience the gestation periods of different crops seem to evaluate crop desirability in terms of annual net revenue. When discussing with Pillet-Schwartz the merits of various

¹Cost/benefit analysis is the preferred tool for analyzing projects from the viewpoint of international creditors, the government and the executing agency. All of these institutions are concerned with financial and social rates of return.

cash crops, a more analytical farmer compared annual and monthly revenue from different cash crops on a given parcel of land. He did not mention anything to suggest he discounted future earnings.¹ Unless crops' gestation periods differ substantially (months versus years) it seems likely that farmers select the crop that has given them or is presently providing their colleagues with the maximum current revenue per man-day, regardless of differences between the duration of various crops' periods of gestation and full production.

Most financial analysis converts all factors of production into the common denominator of money. In land abundant rural West Africa, maintaining proprietors' labor separately and calculating the return per man-day may offer a closer approximation to rural decisionmaking.

Revenue will be examined for two dates representative of the major periods of agricultural pricing policy in the Ivory Coast. From 1962/1963 to 1972/1973 the guaranteed farm-gate prices of the major cash crops (cocoa, coffee, oil palm, cotton, and rice) rose very gradually. Data from the late 1960s will be used to calculate typical incentives for this period.

¹Cited from: Anne-Marie Pillet-Schwartz, "Capitalisme d'Etat et Développement Rural en Côte d'Ivoire; la Société pour le Développement et l'Exploitation du Palmier à Huile en Pays Ebrié" (dissertation for doctorat de troisième cycle, Ecole Pratique des Hautes Etudes, 1973), pp. 174-175.

From the 1973/1974 growing season onwards, prices increased sharply. By the late 1970s, oil palm prices were nearly double their 1970/1971 levels; cocoa prices had tripled. The structure of incentives under the regime of rapidly rising prices will be estimated by prices during the late 1970s.

During the 1960s, returns per man-day of cocoa cultivation exceeded all alternatives.¹ Oil palm and coffee also provided income per man-day several times greater than the official minimum agricultural wage. Evaluated in terms of net cash return on cash invested, and in terms of benefit/cost ratios, cocoa remains the most remunerative of the three crops.² Crops in the savannah have never been highly lucrative for the peasantry, but the opportunity to earn a relatively reliable cash income, even a minimal one, provided sufficient incentive for widespread adoption of cotton.³

Relative price incentives in the forest zone during the latter 1970s did not differ significantly from those of the previous decade. Cocoa remained the most profitable cash crop

¹Table 6 indicates that oil palm revenue slightly exceeded that of cocoa, but the yield data from which the oil palm revenue was calculated were very optimistic. The figures are from SODEPALM, so the optimism is understandable.

²See: Elliott, "Benefit-Cost Analysis," p. 353, (table 6.8).

³During the mid 1970s, official rice prices were very high. However, most farmers were unable to obtain the official price.

TABLE 6

GROSS RETURNS PER MAN-DAY FOR SELECTED CROPS
IN FULL PRODUCTION THE IVORY COAST 1966-1970

Crop	Cultivation Technique	Yield Kg./ha.	Price CFA/kg.	Gross Value CFA/ha.	Man-Days of Labor	Gross Return per Man-Day
Cocoa	Traditional	300 ^a	70	21,000	35 ^a	600
	Average	400 [*]	70	28,000	38 ^c	737
	Improved	900 [*]	70	63,000	80 ^c	788
Coffee	Traditional	350 ^a	90	31,500	70 ^a	450
	Advanced	900 ^d	90	81,000	127 ^a	638
Oil Palm	Traditional	6,000 ^g	4	24,000	42 ^g	571
	Traditional	11,500 ^h	4	46,000	52 ^h	885
Rice	Improved (manual)	1,800 ^a	18 ^{**}	32,400	110 ^a	295
	Irrigated (manual)	5,700 ^a	18 ^{**}	102,600	300 ^a	342
Cotton	Manual	880 [*]	33.5	29,480	114 ^c	259
Official Minimum Agricultural Wage						156

* Author's estimate, based on actual yields

** Charles P. Humphreys and Patricia L. Rader, "Rice Development Strategies: Rice Policy of the Ivory Coast" (United States Agency for International Development, July 1979), table A-9.

Note: the other footnotes are listed on page 128.

TABLE 7

RETURNS PER MAN-DAY FOR SELECTED CROPS IN FULL PRODUCTION.

THE IVORY COAST 1976-1980 (CFA francs)

Crop	Cultivation Technique	Yield kg./ha.	Price CFA/kg.	Gross Value CFA/ha.	Cash Cost CFA/ha.	Net Value CFA/ha.	Man-Days of Labor	Net Return per Man-Day
Cocoa	Traditional	300 ^a	250 ^b	75,000	1,000 ^c	74,000	35 ^a 50 ^e	(2,114) (1,480)
	Average	460 ^d	250 ^b	115,000	8,000 ^d	107,000	40 ^d	2,675
	Improved	1,000 ^f	250 ^b	250,000	6,800 ^f	243,200	83 ^a 101 ^f	(2,930) (2,408)
Coffee	Traditional	350 ^a	250 ^b	87,500	6,500 ^c	81,000	70 ^a	1,157
	Advanced	900 ^d	250 ^b	225,000	21,000 ^d	204,000	127 ^d	1,606
	Improved	1,000	250 ^b	250,000	35,000 ^c	215,000	140 ^a	1,536
	Improved	1,100 ^a	250 ^b	275,000	40,000 ^c	235,000	140 ^a	1,679
Oil Palm	Traditional	6,000 ^g	10 ⁱ	60,000	7,000 ^g	53,000	42 ^g	1,262
	Traditional	11,500 ^h	10 ⁱ	115,000	26,150 ^h	88,850	52 ^h	1,709
	Improved	12,000 ^e	10 ⁱ	120,000	6,525 ^e	113,475	52 ^e	2,182
Coconut	Improved	10,000 ^j	7 ^b	70,000	28,000 ^k	42,000	24 ^k	1,750
Rubber	Improved	1,500 ^e	130 ^e	195,000	8,195 ^e	186,805	81 ^e	2,306
	Improved	1,600 ^l	230 ^l	368,000	9,000 ^c	359,000	83 ^c	4,325
Rice (upland) (irrigated)	Traditional	750 ^a	75 ^b	56,250	5,000 ^c	51,250	90 ^a	569
	Improved (manual)	1,800 ^a	75 ^b	135,000	16,000 ^c	119,000	110 ^a	1,082
	Improved (oxen)	2,000 ^a	75 ^b	150,000	25,000 ^c	125,000	80 ^a	1,563
	Manual	5,700 ^a	75 ^b	427,500	75,000 ^c	352,500	300 ^a	1,175
	Mechanized	8,300 ^a	75 ^b	622,500	150,000 ^c	472,500	288 ^a	1,641
Cotton	Manual	1,100 ^c	80 ^b	88,000	1,000 ^c	87,000	136 ^c	640
	Animal traction	1,300 ^a	80 ^b	104,000	10,000 ^c	94,000	116 ^a	810
Maize	Traditional	700 ^e	25 ^e	17,500	900 ^e	16,600	70 ^e	237
Yams	Traditional	6,000 ^e	35 ^e	210,000	27,000 ^e	183,000	210 ^e	871
Cassava	Traditional	5,000 ^e	30 ^e	150,000	0 ^e	150,000	100 ^e	1,500
Plantains	Traditional	4,500 ^e	40 ^e	180,000	0 ^e	180,000	60 ^e	3,000

^aWorld Bank, Ivory Coast, p. 414, table SA76.

^b1980 price.

^cAuthor's estimate based on World Bank data.

^dInternational Coffee Organization, "Coffee in the Ivory Coast--1977" (London: Executive Board, ICO, 18 April 1978), p. 36.

^eWorld Bank appraisal of S.A.P.H. rubber project, 1978.

^fBETPA, "Projet de Développement Agricole Intégré de la Région du Centre Ouest; Etude de Factibilité" (Abidjan: BETPA, April 1980), annex 2, appendix 9, table 1.

^gAuthor's estimate calculated from data in SODEPALM, "Les Plantations Villageoises de Palmier à Huile; Evolution de la Production" (Abidjan: SODEPALM, January 1980); and in annual reports from 1975 to 1979.

^hBETPA, "Schéma Directeur en vue de la Réalisation Eventuelle de Nouvelles Huileries de Palme ou de la Rentabilisation du Potentiel Existant" (Abidjan: BETPA, June 1980).

ⁱFrom 1974 to 1976 the farmgate price was 8 CFA/kg.; from 1977 to 1980 the price was 10 CFA/kg.

^jTen thousand nuts, not kilograms. The figure is from SODEPALM, "Plantations Villageoises," p. 33.

^kAuthor's estimate, calculated from data in International Coffee Organization, "Coffee," p. 36.

^lSODEPALM, "Plantations Villageoises." p. 33.

per man-day under traditional cultivation techniques. Smallholders who marketed plantains and rubber benefited from an even higher return per man-day, but market channels for these crops were not widespread. Oil palm, coconut, and coffee all provided revenue per man-day at least quadruple the 1976 minimum daily agricultural wage of 250 CFA: incentives to expand cash crop agriculture remained strong throughout the 1970s.

In the savannah, cotton and upland rice production provided less income per man-day than did the forest crops. Without the massive government fertilizer subsidies for cotton and irrigated rice during the late 1970s, returns per man-day in the savannah would have been considerably lower than those in the forest zone. With the subsidies, irrigated rice production became quite remunerative per man-day, and cotton at least stayed ahead of the minimum agricultural wage.

Improved rice cultivation appears to generate much higher net returns per man-day than does cotton. However, since the 1970s, the state rice marketing authority has consistently lacked sufficient cash to purchase all the rice cultivated. Dioula and Lebanese traders purchase much of the rice crop at prices well below the official price. By contrast, the CIDT purchases all cotton produced in the Ivory Coast at the officially decreed price. Cotton is, therefore, a good deal more competitive in the savannah than a comparison of net revenues per man-day of cotton and rice would suggest.

D. Evaluating Ivorian Agricultural Policy

The economic logic of Ivorian agricultural policy can be assessed by determining whether or not investments and price incentives have encouraged cultivation of those crops for which the Ivory Coast holds a comparative advantage. Comparative advantage can be evaluated by calculating the domestic resource cost (DRC) of the foreign exchange earned by agricultural exports or saved by reduced imports of each crop. If a crop's DRC ratio exceeds unity, the Ivory Coast is investing more resources in producing the crop than it would cost to simply purchase it on world markets. Conversely, if the DRC coefficient is less than unity, the Ivory Coast is expending fewer resources to produce the crop than would have to be expended to buy the crop on the world market. The economic logic of comparative advantage dictates cultivating crops with low DRCs, and eschewing those crops whose DRCs are greater than one. Stryker (1977) calculated DRCs for agriculture in the Ivorian forest and savannah zones.¹ Using either traditional or intensive cultivation techniques, coffee, cocoa, oil palm, coprah, and fresh pineapples had low DRCs in the forest zone, indicating a strong comparative advantage in these crops. By contrast, bananas' DRC was slightly higher

¹He used 1972 data, but the results appear to be very robust: calculations based on projection for 1985 came out extremely close to 1972 DRCs.

than unity, and the DRCs of rice were much higher. The most traditional technical package for rice--rainfed rice cultivated manually--had, in fact, the least objectionable DRC (1.98). Fully mechanized rice cultivation had a DRC of 9.12! In the savannah, DRCs are higher, which is consonant with the relatively poor agricultural resource endowment of that region. Nevertheless, cotton, groundnuts, and maize all had DRCs close to unity. When cultivated with animal traction, their DRCs drop to roughly 0.8. Rice, once again, is uneconomical (except in rotation with other crops), and the least economical technique for cultivating rice remains full mechanization (DRC of 10.50).

The DRC calculations suggest that the Ivory Coast was correct to make significant investments in cocoa production, and that the choice of palm products as the first major area of agricultural diversification was a judicious one.¹ While the savannah zone lacks the potential of the forest zone, cotton production is profitable for the Ivory Coast, especially when cultivated by animal traction.

By contrast, the government neglected coffee during the 1960s, both in terms of investment and producer prices. Although the cocoa sector received important government investment over that period, cocoa producer prices stagnated.

¹The Ivory Coast also holds a comparative advantage in producing fresh pineapples. DRC calculations for natural rubber are not yet available, but rubber probably holds a comparative advantage.

In fact, pre-Independence producer prices of cocoa and coffee were significantly higher in real terms than any official prices subsequently offered by the independent government to its own citizens. This policy does make sense in terms of a young republic's urgent need for funds, but it runs counter to the economic logic of encouraging activities with low DRCs.

The government has invested heavily in two unprofitable crops: sugar and rice. Expenditures for sugar and rice totalled approximately twenty-nine percent of planned government investment in the agricultural sector during the period 1971-1980. (See table 5). The government has maintained very high producer prices for rice since the mid 1970s; more recently, it has also fully subsidized fertilizer used for cultivating irrigated rice. Ironically, the more successful the government is in its drive to modernize rice cultivation, the more unprofitable for the nation rice production becomes: losses increase as the cultivation techniques grow more sophisticated.

Sugar has remained an industrial crop, so producer price policy has played no role in encouraging sugar cultivation. The Ivory Coast's problems with sugar stem primarily from the choice of over-sophisticated and extremely expensive sugar mills. Current and foreseeable world sugar prices are about half the level that the Ivorian sugar agro-industry needs to break even. Aside from these economic mistakes--neglect of

the coffee sector and unsound expenditure on rice and sugar-- the Ivorian government has implemented a policy of investment and producer prices that harmonizes well with the nation's comparative advantage.

Considerations of comparative advantage must be complemented by considerations of demand for the crop, and the supply of factors of production. Coffee and cocoa expansion-- dictated by the logic of low DRCs--runs up against limited world demand and quotas assigned by the International Coffee Agreement and the International Cocoa Agreement. This justifies to some extent the government's relative neglect of coffee. Demand for palm products, on the other hand, is strong. Because various vegetable oils are close substitutes, the market is highly price elastic. Low-cost Ivorian exports can, therefore, expand a great deal. However, change in the market for land means that production will have to shift away from the region surrounding Abidjan, where rising prices for hectarage make oil palm (and coconut) unprofitable. The market for fresh pineapples is restricted by a quota on shipments to France, which pays a preferential price for Ivorian pineapples. In fact, pineapple production is profitable for the Ivory Coast even without the artificially high French price. Exports are thus likely to expand, although at a rate well below the period when additional production still fell within the French quota. Domestic demand for rice is artificially strong, and will drastically decline if the government ceases to subsidize

the retail price of rice.

Cotton, maize, and groundnuts (all with DFCs below unity) offer less glamorous marketing opportunities than forest products, but demand for all of these is easily sufficient to absorb foreseeable increases in Ivorian production. In addition, as Stryker (1977:40) notes, encouragement of savannah agriculture assists a government priority: to reduce the economic inequity between the forest and the savannah.

The supply of the chief factors of production, land and labor, is unlikely to impose serious constraints on Ivorian agriculture in the near or medium term. Arable land is scarce in the southeastern coffee and cocoa belts, the area surrounding Abidjan, and the densely populated Korhogo region in the North. However, the Southwest and the North still hold considerable reserves of idle arable land. Despite complaints about the disappearance of agricultural migrant laborers, detailed studies indicate that the numbers of migrants has not dwindled--rather, that migrants now cluster on very large plantations, to the frustration of smallholders.¹ The chief caveat that factor and product markets add to the DRC calculations is, therefore, that cocoa and coffee output cannot be increased much beyond current levels, while production of certain other forest and savannah crops can profitably

¹See: Jean-Marc Gastellu, "Disparition de la Main-d'oeuvre Etrangère?" Cahiers Ivoiriens de Recherche Economique et Sociale, no. 23 (December 1979), pp. 17-45.

expand a great deal. Rice and sugar production, although misguided in terms of DRCs, has arguably raised national social welfare by injecting revenue and creating industry in the North.

PART III
THE CASE STUDIES

IX. PARASTATALS IN THE COTTON SECTOR: THE CIDT

A. The Cotton Sector and Early State Intervention

The cotton growing zone of the Ivory Coast includes the northern savannah and forested savannah, as well as the northern fringes of the forest zone: roughly 190 thousand square kilometers. The ecologies of these three regions differ significantly. The northern savannah has a single rainy season with adequate and reliable precipitation from May to October, followed by dry weather during the cotton harvest season. The forested savannah has an unreliable bimodal rainy season. Farther south, in the forest zone, the bimodal pattern of precipitation is more abundant but only slightly more reliable. Forest zone soils are richer than those in the savannah, and cotton must compete with commercial tree crops.

The erratic bimodal precipitation pattern in the forest and forested savannah generates a number of agricultural problems. Unreliable rains may prevent proper drying of the first crop and interfere with timely sowing of the second. Food crops, especially upland rice, which are cultivated in rotation with cotton, run a significant risk of crop failure due to poor rainfall. The dampness and relatively lush vegetation result in infestations of plant parasites and

tsetse fly that are more severe than in the drier northern savannah.

Cotton is no newcomer to the Ivory Coast. The first cotton ginnery, built at Bouaké, was completed in 1913. Farmers in the savannah regions cultivated local Barbados varieties of cotton, usually in mixed stands with food crops. Yields were extremely low (around one hundred kilograms per hectare), parasites were rampant, and quality was very poor. In 1950 the Institut de Recherches du Coton et des Textiles Exotiques (IRCT) in Bouaké began distributing "Mono"; an improved Barbados variety whose yield and quality surpassed the local stock. However, farmers continued to cultivate cotton using traditional techniques and in mixed stands with food crops. Yields of Mono stagnated at around three hundred kilograms per hectare. From 1955 on, the Compagnie Française pour le Développement des Fibres Textiles (CFDT) conducted a program of agricultural extension promoting Mono cultivation. Production and yields remained modest, peaking in 1962/1963 at 11,300 tons of raw Mono cotton.

In 1963, the cotton sector changed dramatically. Taking advantage of newly developed pesticides, the IRCT had developed the "Allen" strain of *Hirsutum* cotton in 1960. The yield possible with Allen cotton was ten times greater than Mono's three hundred kilograms per hectare. Spurred by this tremendous agricultural potential, the Ivorian government established an agreement with the CFDT that gave the company responsibility

for expanding Allen cotton production, processing the raw cotton and marketing the fiber. The combination of the IRCT's continuing agricultural research and the CFDT's organizational efficiency produced perhaps the most outstanding case of successful state intervention to expand agricultural production in the Ivory Coast.

During the three years between the 1962/1963 growing season and 1965/1966, Allen cotton production increased over tenfold. Fifteen years after 1962/1963, Ivorian Allen cotton production had expanded by a factor of one hundred, yields had risen by one-third, and farmer acceptance of modern agricultural techniques was spreading rapidly.

B. Cotton Cultivation: Peasants and Parastatal in a Joint Venture

Allen cotton produces commercial yields only when a large set of inputs are provided according to a rigorous schedule. The feedback lag-time between providing the inputs and obtaining a given yield is short: a matter of months. Resources at stake in growing cotton range from low (manual), and moderate (ox cultivation), to high (mechanization). Significant resources are at stake in processing raw cotton: cotton ginneries constitute a large capital investment. Total stakes in the cotton sector are, therefore, high. Cotton stores well if it remains dry, so ginneries can operate at a distance from the cotton growing regions and maintain sizable buffer stocks of raw cotton to ensure a steady supply of raw material.

TABLE 8

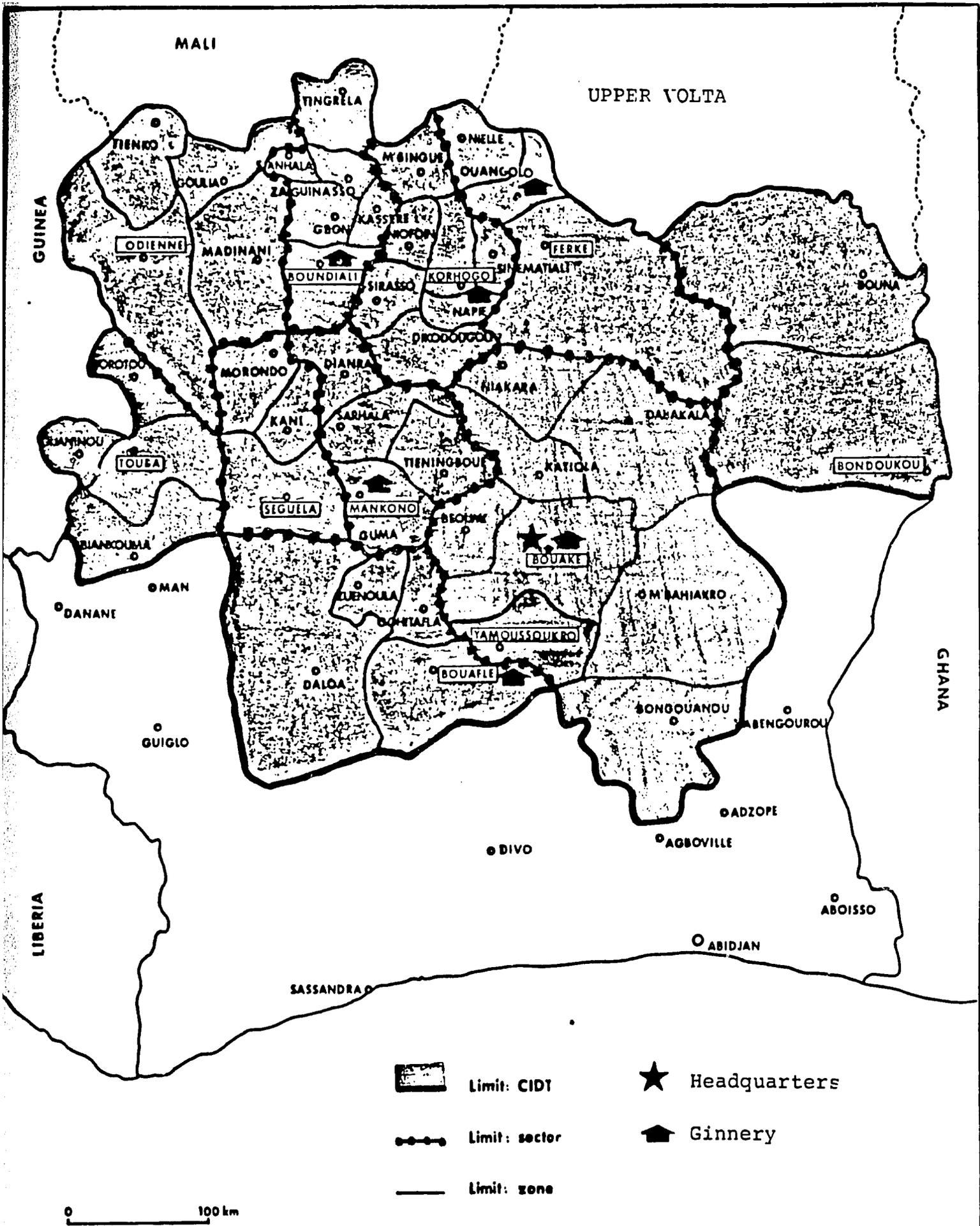
PRODUCTION OF ALLEN COTTON IN THE IVORY COAST

<u>Season</u>	<u>Area Cultivated (hectares)</u>	<u>Raw Cotton Production (tons)</u>	<u>Yield (kg/ha)</u>	<u>Number of Farms</u>	<u>Population Participating (thousands)</u>	<u>Average Farm Size (ares)</u>
1960-1961	137	69	504	n.a.	n.a.	n.a.
1961-1962	272	240	885	n.a.	n.a.	n.a.
1962-1963	1,278	765	600	n.a.	n.a.	n.a.
1963-1964	2,518	2,051	815	n.a.	n.a.	n.a.
1964-1965	6,408	5,527	863	n.a.	n.a.	n.a.
1965-1966	11,768	9,125	775	n.a.	n.a.	n.a.
1966-1967	23,810	22,047	925	n.a.	n.a.	n.a.
1967-1968	38,968	32,284	828	n.a.	n.a.	n.a.
1968-1969	48,139	41,739	867	61,863	n.a.	67
1969-1970	33,345	32,320	970	43,778	300	76
1970-1971	35,867	29,316	817	45,569	325	76
1971-1972	51,400	48,527	944	61,866	430	83
1972-1973	56,495	52,798	936	66,621	465	83
1973-1974	58,188	58,465	1,005	68,353	480	85
1974-1975	58,756	59,939	1,020	69,203	485	85
1975-1976	65,475	65,058	994	78,656	550	83
1976-1977	64,767	75,413	1,164	71,373	580	91
1977-1978	87,549	102,929	1,176	90,416	630	97
1978-1979	107,254	114,886	1,071	94,977	665	113
1979-1980	122,983	136,000	1,100			

Source: CIDT

FIGURE 12

ZONE OF CIDT ALLEN COTTON PROGRAM 1980



Source: CIDT

Farmers cultivating cotton manually obtain a rapid one-time return on a low investment. Their firm commitment to cotton production only lasts through the current growing season. After that, they are free to continue or abandon cotton cultivation. Farmers who have invested in oxen or a tractor have a longer-term commitment to cotton; they typically pay back the cost of their investment over several years.¹

The cultivation requirements of Allen cotton are far more exacting than those of crops traditionally grown in the savannah. Thus, smallholders could not be expected to independently produce yields of Allen cotton that were either profitable for themselves or sufficient for a cotton processing industry. Major investment in ginneries, however, has meant that the cotton parastatal must be absolutely certain of an adequate level of cotton production.

The strategy most reliably ensuring this supply would have been for the cotton parastatal to manage its own industrial cotton plantations, with a labor force composed primarily of Voltaics and Malians. This solution, however, fails to advance the Ivorian government's goal of raising the living standard of Ivorian farmers living in the savannah. Moreover, the housing and social services required for plantation laborers on such a visible project would pose a financial burden; one

¹Of course, farmers may be able to pay back the cost of oxen or a tractor by cultivating a crop other than cotton.

that could be avoided with smallholder cotton production.

During the 1960s, the CFDT attempted to combine the virtues of smallholdings and industrial plantations. Large plantations were bulldozed and then divided into parcels, which were allotted to individual participating farmers from surrounding villages. The CFDT provided free seed and insecticide. Fertilizer was provided on credit, and the CFDT purchased at the official farm-gate price all cotton produced. CFDT extension agents closely supervised the plantation.

Farmers complied with the CFDT's rigorous and unfamiliar agricultural program for several reasons. Cotton was the sole cash crop in the savannah zone for which a reliable purchaser existed.¹ Income per man-day devoted to cotton cultivation exceeded the remuneration of most alternative occupations. With an annual production cycle, farmers who refused to cooperate with the CFDT's regulations could be excluded from the program quite rapidly.²

¹In the forest and forested savannah, farmers could also cultivate coffee and cocoa, for which there were organized market channels. Turnover among cotton farmers participating in the CFDT's program was higher in the forest and forested savannah than in the true savannah.

²Jacqueline Peltre-Wurtz and Xavier le Roy, "Action de Développement en Pays Senoufo; L'Action de la CIDT dans Deux Communautés Rurales Situées au Nord et au Sud de Boundiali" (Abidjan: ORSTOM, 1976), found that many farmers, who failed to prepare their cotton fields early enough, were not given any cotton seed by the CIDT.

The CFDT did not control the farm-gate cotton price. Setting this remained the prerogative of the Ivorian government, which retained the same price of about 33.5 CFA per kilogram of raw cotton throughout the entire decade of the 1960s. Over this period, inflation significantly eroded the purchasing power farmers obtained per kilogram of raw cotton. Concomitantly, labor requirements on the large plantations rose considerably due to burgeoning weeds.¹ The combination of lower real price and rising labor demands greatly reduced the real return per man-day in cotton cultivation. In 1969, the CIDT introduced the requirement that farmers sort their cotton into first and second grades. This additional obligation seriously dampened the already waning enthusiasm for cotton. Inclement weather also diminished production in 1969 and 1970.²

Unlike the case of a forest perennial which may still produce for some years after unenthusiastic farmers cease investing in anything but harvesting, farmers' disenchantment with cotton quickly translated into a sharp decline in cotton production. From 1968 to 1969, cotton production declined twenty-three percent; hectareage declined thirty-one percent.

¹The large blocks were prepared with heavy farm machinery. Deep plowing cut the weeds' roots, causing them to multiply much faster than weeds on fields cleared by hand or by animal traction.

²Food crops rarely competed with cotton as a source of cash: there were virtually no marketing channels for food crops. However, in the region of unreliable bimodal rainfall, if the first rains failed, hectareage planned for cotton during the second rainy season would be planted in subsistence crops.

The following year, 1970, hectareage increased but yield fell sharply, pulling production down to only seventy percent of the level in 1968.¹

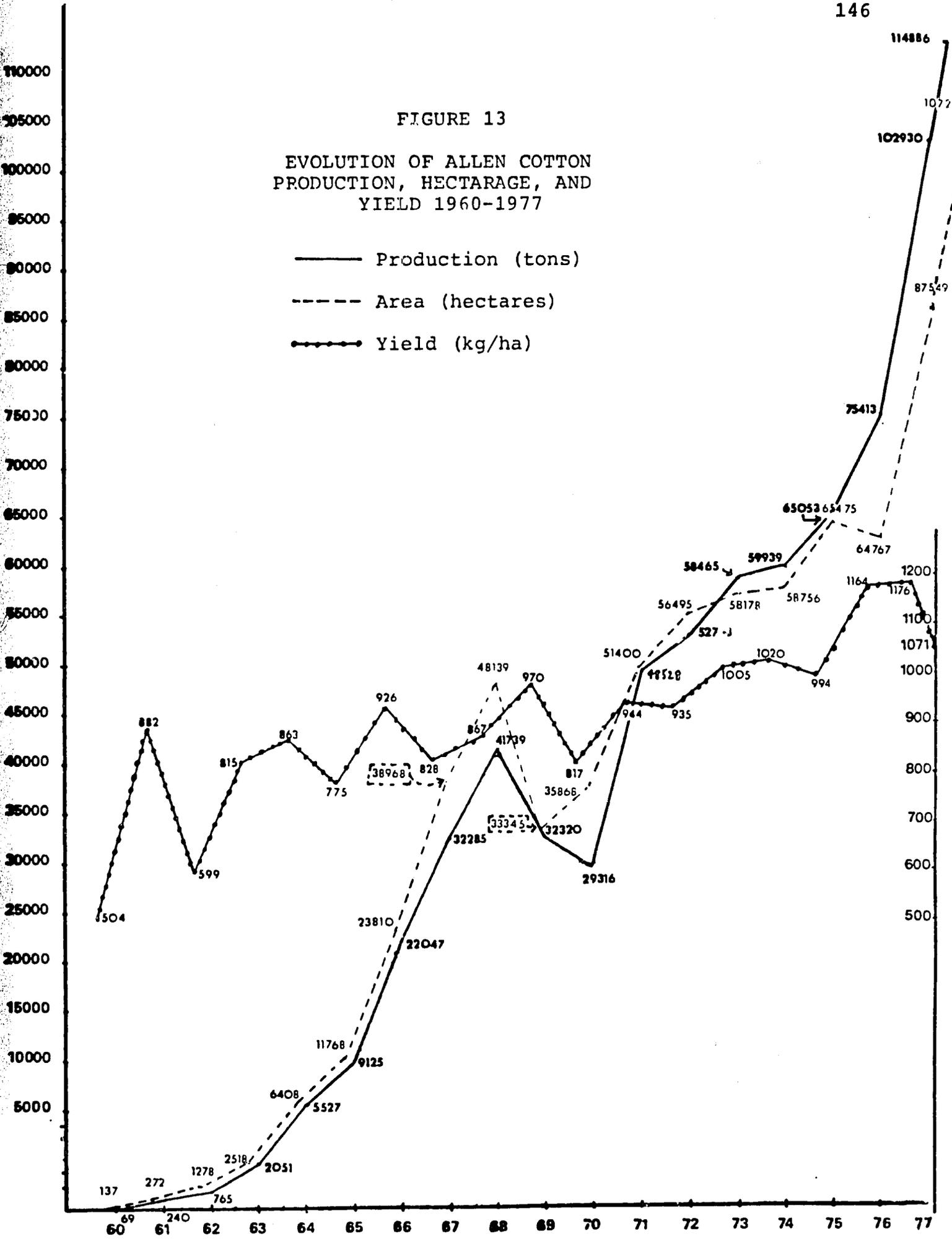
The CFDT responded to this crisis by altering both marketing and production. A price differential between first and second quality cotton was established in 1969/1970; producer prices were raised fifteen percent the subsequent growing season, and the CFDT applied regulations on quality control less stringently than before. Gradually abandoning the policy of promoting modern cotton cultivation parallel to and isolated from traditional food crop production, the CFDT sought to integrate cotton cultivation into subsistence agriculture. These steps succeeded in returning cotton production to a pattern of steady expansion (see figure 13).²

¹See figure 13. The decline was especially severe in the forested savannah and forest zones where, as previously noted, farmers had alternative cash crops and, if the rainy season was inclement, planted subsistence crops in the place of cotton during the second rainy season.

For a detailed description from the peasants' viewpoint of the factors hindering cotton production in the savannah, see: William C. Gunderson, "Village Elders and Regional Intermediaries: Differing Responses to Change in the Korhogo Region of the Ivory Coast" (Ph.D. dissertation, Indiana University, 1975), pp. 158-164.

²It is worth noting that in some areas virtually no policy by the CIDT or the Ivorian government could introduce cotton cultivation. Asseh N'Goran, "Les Structures de Production Agricole et l'Introduction de la Semi-Mécanisation dans la Région Centre de Côte d'Ivoire, Zone de Savane; Cas de la Sous-Prefecture de Botro" (thesis for Diplôme d'Ingénieur Agronome, Ecole Nationale Supérieur Agronomique de Montpellier, October 1979), pp. 69, 74, describes village elders who proscribed the cultivation of cotton in Botro on the grounds that it offended the earth deities.

FIGURE 13
EVOLUTION OF ALLEN COTTON
PRODUCTION, HECTARAGE, AND
YIELD 1960-1977



Source: CIDT

C. The Impact on the Peasantry

Cotton cultivation has introduced to the savannah a host of agricultural innovations: mechanization, animal traction, fertilizer, and pesticides. During the period from 1970/1971 to 1977/1978, the number of hectares of cotton under mechanized cultivation nearly tripled. Especially in the North, which is free from tsetse fly, animal traction expanded with spectacular speed. In seven years, the total area under ox cultivation rose from seventy-eight hectares to almost fifteen thousand hectares. The proportion of farmers fertilizing their cotton increased steadily over this period, reaching ninety-seven percent after fertilizer was completely subsidized by the government in 1977/1978. The combination of the new cultivation techniques, increased fertilizer use, and further improved cotton varieties developed by the IRCT raised yields per hectare by one-third.

Net annual cash revenues from cotton per farm participating in the CFDT/CIDT program, which had declined in real terms during the 1960s, more than doubled in real terms from 1970 to 1978 (see table 10). Rising yields played a role, but the key factors were a fifty-six percent producer price hike in 1974/1975 and introduction in 1978 of a full government subsidy for fertilizer. Income in real terms per hectare of cotton stagnated during the first half of the 1970s, and then increased significantly. Net revenue in constant CFA per man-day of cotton cultivation followed the same pattern: stagnation through

TABLE 9
INDICES OF AGRICULTURAL MODERNIZATION
IN COTTON CULTIVATION 1970-1978.

Season	Animal Traction (ha.) (%) ^a	Mechanized Agriculture (ha.) (%) ^a	Use of Fertilizer (ha.) (%) ^a	Use of Insecticide (ha.) (%) ^a	Yield Kg/ha.
1970-1971	78 (0%)	1,499 (4%)	30,935 (86%)	35,868 (100%)	817
1971-1972	320 (1%)	1,954 (4%)	45,224 (88%)	51,400 (100%)	944
1972-1973	795 (1%)	2,785 (5%)	50,569 (90%)	55,829 (99%)	935
1973-1974	1,589 (3%)	2,338 (4%)	53,272 (92%)	58,114 (100%)	1,005
1974-1975	2,740 (5%)	1,976 (3%)	54,797 (93%)	58,756 (100%)	1,020
1975-1976	5,583 (9%)	2,316 (4%)	60,663 (93%)	65,475 (100%)	994
1976-1977	10,853 (17%)	2,993 (5%)	60,080 (93%)	64,767 (100%)	1,164
1977-1978	14,817 (17%)	4,333 (5%)	84,665 (97%)	87,549 (100%)	1,176

^aPercent of total cotton hectarage.

Source: CIDT

1974, then considerable increase to 1978 (see table 11). Cotton growers received net revenues totalling 28.7 billion CFA during the 1968-1978 period, over half of that during the last three years.

The effect of the cotton program on traditional food crops is the subject of debate. An unofficial World Bank report cites evidence that cotton growers obtained yields per hectare of food crops that exceeded other farmers' yields. This could mean that cotton farmers had begun to utilize modern farming techniques (such as regular weeding) not only on cash crops but also on subsistence agriculture.¹ By contrast, Ravenhill (1980:43-44) argues that extension agents only encourage modern techniques for the production of cash crops. He found that oxen were only used to grow commercial crops. Peltre-Wurtz and Steck (1979) conducted an in-depth study of cotton production and ox cultivation in a region of the Ivorian savannah. They found cotton caused a significant reallocation of land and labor devoted to cash cropping: one-third of the land and forty percent of farmers' labor was devoted to cultivating cotton. However, cotton cultivation had virtually no effect on the cultivation techniques for subsistence crops.

Cultivating traditional crops in small fields and mixed

¹An alternative explanation not considered in the World Bank report is that only more energetic farmers cultivate cotton. These farmers' yields on all crops would surpass the yields of their less dynamic colleagues.

TABLE 10
EVOLUTION OF COTTON PRICES AND FARM INCOME
FROM COTTON CULTIVATION: 1968-1978

Season	Cotton Price: Qualities		Cotton: Weighted Average Price (CFA/kg)	Index of Cotton Prices	Farmers: Total Net Revenue (billion CFA)	Net Revenue Per Farm (CFA)	Net Revenue Per Farm (Index)	Index of Net Farm Revenue in Constant 1968-1969 CFA
	1	2						
1968-1969	33.5	33.5	33.50	100	1.3	19,932	100	100
1969-1970	35	30	34.51	103	1.1	22,324	112	107
1970-1971	40	30	39.57	118	1.02	21,925	110	101
1971-1972	40	30	39.60	118	1.72	27,850	138	118
1972-1973	40	30	39.77	119	1.81	26,230	133	108
1973-1974	45	35	44.84	134	2.29	33,505	168	132
1974-1975	70	60	69.90	209	3.45	49,870	251	169
1975-1976	70	60	69.92	209	3.66	46,530	236	144
1976-1977	80	70	79.86	239	4.10	57,370	363	202
1977-1978	80	70	79.92	239	8.23 ^a	90,980	456	231

^aIncludes fertilizer subsidy of 1.50 billion CFA

Source: CIDT, BETPA

TABLE 11
 EVOLUTION OF INCOME PER HECTARE
 AND PER MAN-DAY FROM COTTON
 CULTIVATION 1968-1978

Season	Net Revenue Per Hectare (Current CFA) ^a	Net Revenue Per Hectare (Constant 1968-1969 CFA) ^b	Net Revenue Per Man-Day (Constant 1968-1969 CFA) ^c
1968-1969	29,749	29,749	220
1969-1970	29,374	28,063	208
1970-1971	28,849	26,489	196
1971-1972	33,554	28,691	213
1972-1973	31,602	25,661	190
1973-1974	39,418	30,972	229
1974-1975	58,671	39,504	295
1975-1976	56,060	34,206	257
1976-1977	63,044	35,083	266
1977-1978	93,794	47,515	360

^aCalculated by adjusting net revenue per farm (see table 10) for average farm size (see table 9).

^bBETPA deflators are used.

^cAverage man-days are weighted for the proportion of hectares under manual cultivation and under non-manual cultivation. From 1968-1969 to 1973-1974, the weighted annual average is 135 man-days. Due to increasing mechanization and ox cultivation, the average annual number of man-days per hectare of cotton decreases to 134 in 1974-1975, 133 in 1975-1976, and 132 during 1976-1978.

Source: CIDT, BETPA

stands in fact makes excellent economic sense. One hectare of pure maize grown with fertilizer produces between 2.5 and 3.0 tons. One hectare of maize and upland rice in traditional mixed cultivation produces 1.9 tons of maize and 0.8 tons of rice: a total of 2.6 tons of cereal with no investment in fertilizer. Especially at harvest, labor requirements are more spread out with mixed stands. Thus, farmers' disinterest in applying modern cultivation techniques to food crops may well maximize their social welfare.

Assessing the effect of cotton production on traditional social structures must remain a primarily speculative endeavor. Stryker contends that cotton has probably reduced the importance of clan heads who formerly stockpiled cereals against famine. Now farmers can purchase food with earnings from cotton. Peltre-Wurtz and le Roy (1976) and Peltre-Wurtz and Steck (1979) found little evidence of increasing rural stratification.¹ Large families with productive young adults were much wealthier than small families. However, when the productive young adults married, they left their parental household, thereby reducing its capacity to generate wealth.

¹Gunderson, "Village Elders," pp. 154-160 found that irrigated rice cultivation had increased economic stratification in the densely populated region surrounding Korhogo. Generally, less than half the farm households in a village cultivated rice and the cash income from a large rice paddy was very large: Gunderson estimated it at a minimum of 120,000 CFA per year during the early 1970s.

The CIDT estimates that roughly seven hundred thousand Ivoirians are now involved in cotton production. For most of these people, cotton is the primary source of money income and their chief contact with modern agricultural techniques. The CIDT's current emphasis on developing crop rotation systems integrating cotton, food crops, and animal husbandry should produce an agriculturally stable pattern of cultivation that provides savannah farmers with reliable sources of both food and cash. .

D. The Organizational Structure of the CFDT/CIDT

In 1964 the CFDT and the government of the Ivory Coast signed a ten year contract, under which the CFDT agreed to plan and implement a program of Allen cotton production which included: providing an extension network and all material inputs required for cotton cultivation; and purchasing, processing, and selling the cotton produced. In return for this, the government made significant financial concessions. It agreed to reimburse the CFDT for all costs incurred, even if these exceeded estimates. Salaries of CFDT personnel working in the Ivory Coast were fixed by the CFDT (and except for the managing director, were paid by the Ivorian government). The CFDT could charge seven percent of current costs to "overhead"--a buffer fund which could be spent largely at the CFDT's discretion.

The organizational structure of the CFDT was clear and

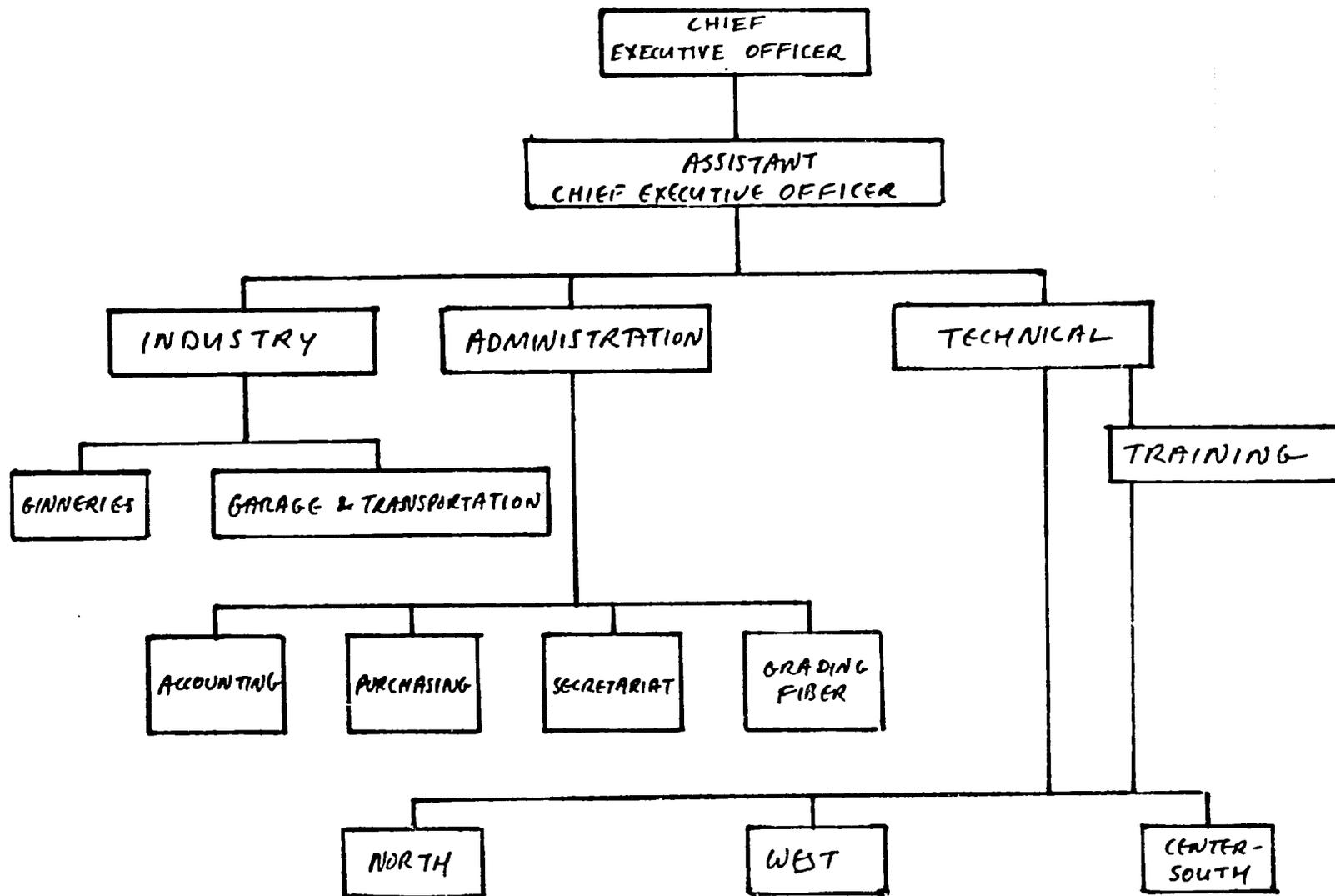
efficient. The board of directors of this French state company was based in Paris, and comprised ten government representatives and five members of the private sector. The company headquarters, also in Paris, handled cotton marketing. Production, however, was decentralized. The board of directors appointed a director general for each subsidiary, and the director general in turn appointed a managing director who ran the subsidiary on a daily basis.

The organizational structure of the CFDT subsidiary in the Ivory Coast was fairly stable throughout its decade of operation. As the chart on the following page illustrates, industrial and financial activities were clearly separated from the agricultural production departments. Technical directors ensured that the CFDT utilized the proper package of agricultural techniques. The size and geographical dispersion of the CFDT's extension network necessitated the formation of a separate unit in charge of overseeing the extension program. Direct responsibility and control of the extension network in the regions distant from headquarters in Bouaké was decentralized to regional heads.¹ These were initially expatriates with considerable experience in African cotton cultivation. Each had an Ivorian assistant who in theory would ultimately take over the position.² Regional

¹This section is drawn partly from Blume, Agro-Industrial Agencies, pp. 154-156.

²The current manager of the CIDT was one of those assistants.

FIGURE 14
ORGANIZATIONAL CHART OF THE CFDT IVORY COAST



Source: CFDT

heads were responsible for coordinating the overall extension, purchase, and transportation network within their region (see figure 14).

Below the regional heads were twenty district heads, each of whom was responsible for roughly 24 hundred hectares. In 1968/1969, only five were Ivorians; by 1972/1973 only nine were Ivorians. The district heads held responsibility for extension, purchase, and transportation of cotton within their district. They oversaw both zone chiefs and extension agents, and made frequent trips throughout their jurisdictions. They were well supported logistically with a company car, house, office, and warehouse for storing supplies. The zone chief lived in his zone, supervising six to eight extension agents. He was responsible for maintaining technical standards and for overseeing the storage of raw cotton, seed, and fertilizer.

Extension agents were recruited from local villages and trained by the IRCT in cotton cultivation. They remained in their home areas, developing expertise on the local situation, and periodically returned to the IRCT for further instruction. Although extension agents lacked any coercive means, they usually had a solid command of cotton cultivation techniques, good rapport with local farmers, and also possessed the power to withhold seed, fertilizer, and insecticide. Each extension agent oversaw between twenty and one hundred hectares of cotton.¹

¹The average number of hectares per extension agent fluctuated between fifty and eighty during the CFDT's tenure.

Farmers had little discretion under this system: either they followed the CFDT's directives transmitted down the chain of authority to the extension agents, or they were excluded from the program.

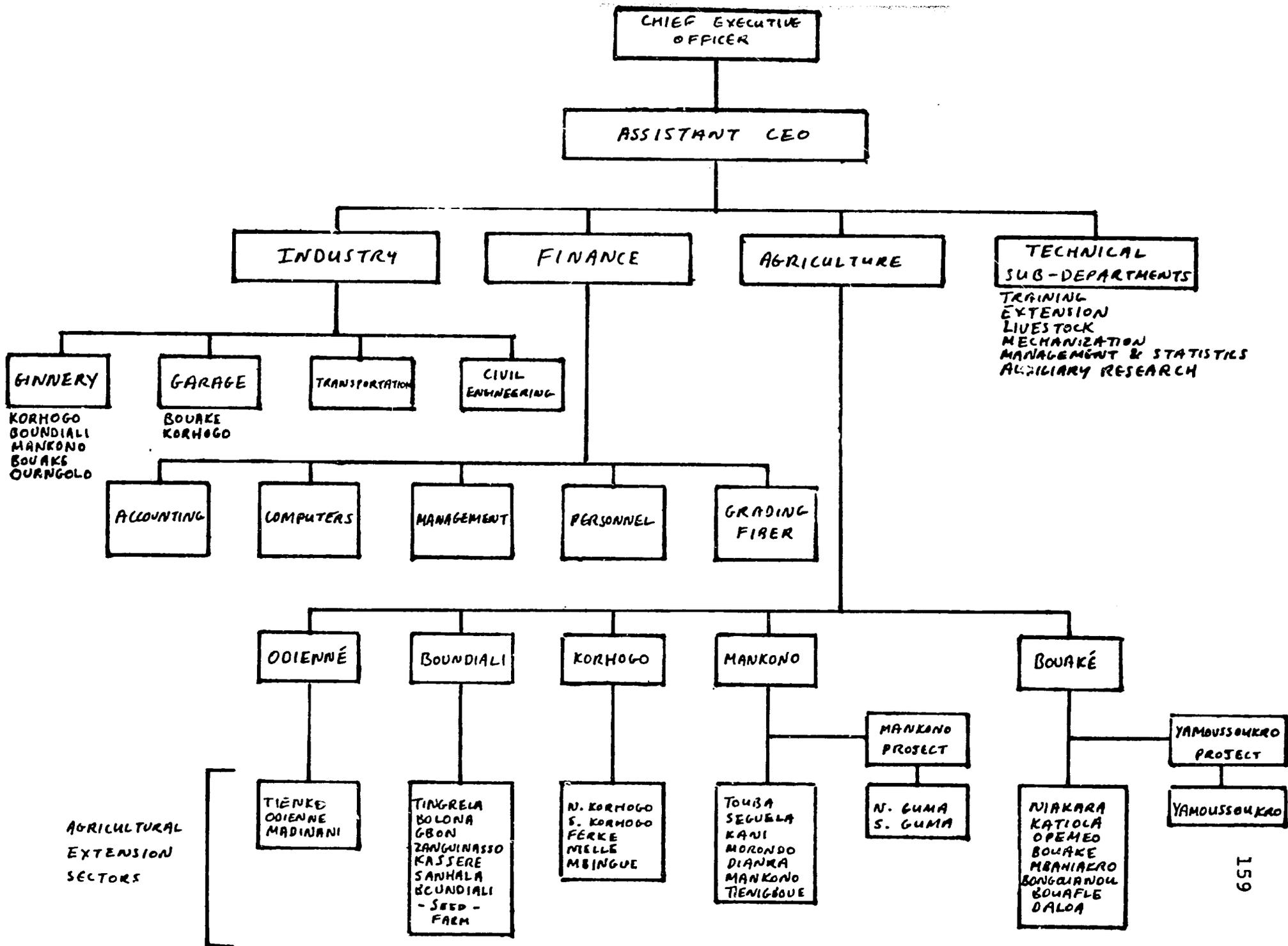
In 1974, the Ivory Coast CFDT subsidiary was transformed from a French parastatal functioning as a private enterprise in the Ivory Coast, to a joint venture between the Ivorian government and the CFDT, called the Compagnie Ivoirienne pour le Développement des Fibres Textiles (CIDT). The CIDT has equity of 1.2 billion CFA, fifty-five percent of which is Ivorian state capital, and forty-five percent of which is from the CFDT. The company's board of directors consists of six representatives of the Ivorian government and four from the CFDT.

The new joint venture has significantly broader responsibilities than the former CFDT.¹ The CIDT is now in charge of: (1) all cotton production, processing, transportation, and marketing; (2) programs to improve food crop production, especially in rotation with cotton; and (3) programs to modernize cultivation techniques through the use of mechanization

¹According to the text of agreement: the company's responsibility in the Ivory Coast is the regional development of the cotton growing zone; in particular, the development of cotton cultivation; and in general, all activities--agriculture, industry, commerce, construction, or finance--that are directly or indirectly connected to this goal, or to any other similar or supplementary goal, or have the potential to facilitate the realization of these goals. (Freely translated by the author.)

and animal traction. As an industrial processor of raw cotton, the CIDT functions as a profit-making enterprise. As the preeminent agricultural parastatal in the savannah zones, the CIDT uses public funds to implement government agricultural policy on a non-profit basis.

The organizational structure and personnel of the old CFDT were maintained largely intact through the transition from CFDT to CIDT. This perhaps explains why there was no hiatus in the steady increase in cotton production during the 1970s. As the CIDT acquired (sometimes reluctantly) new responsibilities, its task became more complex. When SODERIZ was liquidated in 1978, almost all of its staff were incorporated into the CIDT, swelling the CIDT's ranks by thirty-one percent in a single year. The organization has coped by restructuring in a more complex form. Instead of three regions, there are now five. The industrial and financial/administrative sections are more diversified and rely to some extent on computerization. Instead of running the extension program with just two units--one in charge of agricultural production techniques, and the other in charge of overseeing training--the CIDT created a third department to handle mechanized agriculture. Mechanized Agriculture and Training were both placed under a new version of the unit formerly in charge of agricultural techniques. By 1977/1978, as figure 15 indicates, the agricultural techniques unit held line responsibility for extension, while the number of specialized



units had proliferated to six: training, extension, livestock, mechanization, management and statistics, and research. The number of extension agents increased to 1,356 (in 1978) and surpassed 1,500 the following year (see table 12).

TABLE 12
PERSONNEL OF THE CIDT ON
1 JANUARY OF SELECTED YEARS

	1975	1976	1977	1978	1979	Percent Increase 1975-1979
Management	47	43	45	55	55	17%
Agricultural Extension	926	956	970	1,356	1,535	66%
Factories	474	448	432	544	614	30%
	241	355	348	393	519	115%
Total	1,688	1,802	1,795	2,348	2,723	61%

Source: CIDT, BETPA

The major hierarchical categories of the CIDT's agricultural extension staff are identical to those of the CFDT: directors, heads of sector, zone chiefs, and extension agents. Directors spend much of their time in the field supervising operations. They meet together once a week to review activities and to plan those of the coming week. Except for the zone chiefs, who meet frequently with their extension agents, the routine vertical flows of information and commands are organized on a monthly basis. Throughout the extension network, a super-

visor sees all his subordinates once a month, while subordinates submit reports to their superiors on a monthly basis.

E. The CIDT's Task and Its Organizational Environment

Following the flow of agricultural production--from research and development to cultivation, purchase and transport, processing, and marketing--reveals that the CIDT relies upon a dozen other organizations for a wide variety of goods and services, but nevertheless retains considerable independence.

Research. The Institute of the Savannah (IDESSA) administers three organizations carrying out specialized research and development for cotton (IRCT), food crops (IRAT), and livestock (CRZ). The IRCT conducts research on new varieties of cotton, and on optimum combinations of fertilizer and pesticide. IRAT investigates alternative techniques for integrating food crops and cash crops. It also develops new varieties of food crops and conducts tests on the effect of fertilizer and pesticide on corn and rice under peasant cultivation. The CRZ provides veterinary training to personnel responsible for the health of oxen in animal traction schemes. It also is improving crop rotation schedules that include forage for oxen.

The Ministry of Agriculture cooperates with the CIDT in agricultural research and statistics, as well as providing

assistance for agricultural training. CIMA adapts standard farm machinery to conditions in the Ivory Coast, and conducts research on the problems of agricultural mechanization. A French research institute, ORSTOM, and an Ivorian research institute, CIRES, cooperate closely with the CIDT concerning economic and sociological studies of the savannah.

Cultivation. Farmers manually clear approximately twenty thousand hectares of new land annually. Mechanized clearing (about eighteen thousand hectares a year) is efficiently carried out by MOTORAGRI, the state corporation in charge of agricultural mechanization. The CIDT itself clears about five thousand hectares a year for animal traction.

The CIDT is directly responsible for obtaining, transporting, and distributing the material inputs for cotton and rice. However, the transportation infrastructure (notably rural roads) is the responsibility of the central government. In a few cases, poor quality roads have hindered the CIDT in transporting needed inputs.¹ The CIDT provides agricultural extension services for cotton, rice, and other food crops, except within the jurisdictions of the Bandama Valley Authority (AVB) and the Civic Service, which utilize their own extension networks. Smallholders do the actual cultivating.

As animal traction has become increasingly important in

¹See Fraternité Matin 26 February 1980, p. 1.

savannah agriculture, the CIDT has strengthened its ties with SODEPRA, the state corporation responsible for livestock, and the Ministry of Livestock. Until 1979/1980 the Ministry of Livestock was responsible for cattle vaccination, and performed inadequately. SODEPRA then took over the task, with much greater success. The CIDT has set up its own livestock department, which cooperates with SODEPRA in vaccination programs and which obtains cattle for animal traction.

Supplementary activities involve additional organizations. The Office Nationale de Promotion Rurale (ONPR), the national rural improvement agency, works closely with the CIDT to establish village cooperatives and pre-cooperatives. The ONPR encourages villages to increase production and undertake self-improvement projects. The national agricultural development bank (BNDA) provides credit to farmers for ploughs, and to tide them through until harvest. These loans are administered through the CIDT.

Purchase and Transportation. The CIDT purchases virtually all cotton; transportation is in the hands of private truckers. Raw cotton can be stored for several months before processing, and the ginneries maintain sizable buffer stocks, so the uncertainty introduced by sub-contracting transportation services poses little threat to the CIDT's viability. Rice is purchased chiefly by the OCPA (the state rice agency that

succeeded SODERIZ in 1978), by the CIDT, and by traders, most of whom are Dioula. Rice and cotton farmgate prices set by the Ivorian government are respected by the OCPA and the CIDT, but not by the Dioula. The OCPA chronically lacks funds, so farmers must sell much of their rice crop to traders. There is no organized purchase or transport of any other crops in the savannah.

Processing. The CIDT gins all cotton in the Ivory Coast. Private enterprises, most with some state equity, process the CIDT's output of cotton fiber and cotton seed. Paddy is hulled in government factories now administered by the OCPA, and by private hullers who compete so successfully with the state factories that the government has banned imports of small rice hulling machines. No other crops with which the CIDT is concerned are processed.

Marketing. Domestic cotton sales are the responsibility of the CIDT. Prices, however, are set by the government (and include a significant subsidy to the domestic textile industry). Cotton exports are managed by the Stabilization Fund (CSSPPA) and the CFDT headquarters in Paris. The OCPA and private traders market rice. There are no state marketing channels for any other savannah crops, but the expansion of food crop production in the Korhogo region indicates that private food crop commercialization is growing rapidly as urban food needs raise food prices to levels profitable for middlemen.

Independence. The CIDT has significant financial autonomy from the central government. Proceeds from the sale of inputs for cotton cultivation, and of processed cotton and fiber and cotton seed constituted seventy-two percent of current income during 1978/1979. Although this does not cover the cost of the full range of the CIDT's agricultural development activities, it provides the organization with a buffer against late funds from the government. Short term agricultural loans from domestic banks at concessional interest rates are another buffer--and this short term debt has expanded tremendously.

Recently, funds from the central government have been quite unreliable. The CIDT submitted its annual program of action and budget request to the Minister of Agriculture in January 1980. When the author visited the CIDT headquarters in mid-May, the annual program was still unsigned. This prevents the CIDT from asking the central government for funds.¹

The CIDT's independence is bolstered by its geographical isolation. Unlike most Ivorian parastatals, the CIDT is not based in Abidjan. Situated in Bouaké, the CIDT's headquarters is frequently out of range of any form of rapid communication.

¹According to CIDT staff, the central government formerly was more punctual with funding. This makes sense: the Ivory Coast underwent an economic slowdown during 1979/1980, and the government was unexpectedly short of cash.

During the author's visit to the CIDT, both the telephone and telex malfunctioned; this was not unusual.

Local government representatives, notably the prefect, seem to exert little authority over the CIDT. The CIDT informally coordinates its activities with them. As a courtesy, it sends the prefect a copy of the monthly CIDT report of activities within his prefecture.

F. Evaluation

The CIDT has succeeded, both as an organization and as an effective development agency. As an organization, the CFDT/CIDT has coped with new structures and new goals. During the decade 1968-1978, the company's net worth multiplied by a factor of eleven. Although profitability (net benefits divided by equity) declined from sixteen percent in 1974/1975 to eight percent in 1977/1978, this chiefly reflects the increase in non-profit social welfare activities as the CIDT gradually assumed the status of the premier savannah region development agency. The proliferation of agricultural activities led to a rapid increase in the cost of personnel at headquarters, averaging forty percent a year during 1971/1972 to 1977/1978. The administrative costs in constant CFA per hectare of cotton cultivated have increased slightly. However, rising yield during the period 1970-1978 has reduced costs per ton of raw cotton in constant CFA. In 1978, the CIDT reached its annual production target of one hundred

thousand tons of raw cotton by 1980: two years ahead of schedule.

Measured in terms of impact on the peasantry, the CIDT has also done well. The average cotton farmer's real income more than doubled between 1968/1969 and 1977/1978. Animal traction is spreading rapidly, and cotton farmers are obtaining increased food crop yields. Although in some cases cultivation of cotton has led to erosion and neglect of food crops, cotton promotion has injected massive sums into the relatively impoverished North. This has significantly reduced the disparity between North and South, as well as permitted the monetarization of farmers in the savannah zone. Table 13 shows the growing impact of the Ivorian cotton program during the period of unbroken growth from 1970 to 1978:

TABLE 13

THE INCREASING IMPORTANCE OF
THE IVORIAN COTTON SECTOR

	<u>1970-1971</u>	<u>1977-1978</u>
Production of raw cotton (tons)	29,300	102,900
Production of ginned cotton fiber (tons)	11,600	41,400
Number of cotton farmers	45,570	90,420
Total population involved (thousands)	325	630
Net revenues distributed (millions of current CFA)	1,020	8,226
Net revenues distributed (millions of constant 1970 CFA)	1,020	4,550
Net revenue per farmer (current CFA)	21,900	91,000
Net revenue per farmer (constant 1970 CFA)	21,900	50,300

Source: BETPA

At the national level, the CFDT/CIDT's successful expansion of the cotton program has permitted the creation of the domestic textile industry. Although the government's net revenues from cotton have been negative since it instituted the fertilizer subsidy, the nation as a whole benefits from cotton's favorable domestic resource cost. In terms of organizational efficiency, national income, agro-industrial linkages, and income distribution, the Ivorian cotton program is a success.

X. PARASTATALS IN THE OIL PALM SECTOR: SODEPALM
AND SMALLHOLDER OIL PALM CULTIVATION

A. The History of the Oil Palm Sector

Palm trees are indigenous to the Ivory Coast, flourishing throughout the coastal zone. Gathering oil palm fruit and processing it into kernels and oil was a traditional occupation, easily transformed into commercial activity. Once the local population discovered the profitable market for palm products, they responded swiftly. By 1905, over six thousand tons of palm oil and kernels were exported.¹ Europeans established the first oil palm estates during 1912 and 1913 and exports climbed, reaching a peak of 22,602 tons in 1925. After the price of palm products collapsed in the Depression, Ivorian exports declined to low levels throughout the 1930s and 1940s, striking bottom in 1947 when the Ivory Coast exported only 1095 tons of kernels and no oil whatsoever. An oil processing mill in Acobo opened in 1950, but the surrounding smallholders failed for over a decade to furnish it with an adequate and regular supply of fresh fruit. By 1959, the

¹In the same year, combined coffee and cocoa exports totaled a mere thirty-one tons.

Ivory Coast was a net importer of palm oil.¹

The newly independent Ivorian government rapidly turned its attention to oil palm. As a route to the long range goal of agricultural diversification, oil palm held several attractions. Imports of palm oil annually averaged five thousand tons during the early 1960s; the government was eager to stem this drain of foreign exchange. The remarkably stable price of palm products would help offset severe fluctuations in coffee and cocoa receipts.² Moreover, palm trees grew well in the Ivorian littoral, and had been the focus of a longstanding program of agricultural research.³

The Ivorian branch of IRHO, the French institute for research on edible oils and oleaginous products had selectively crossed indigenous palms with high-yielding dwarf strains. The resulting hybrids produced ten times more fresh fruit bunches than traditional palms (three tons versus three hundred kilograms per hectare), and the hybrids'

¹For a good description of the oil palm industry during the colonial period, see Anne-Marie Pillet-Schwartz, "Capitalisme d'Etat et Développement Rural en Côte d'Ivoire; La Société pour le Développement et l'Exploitation du Palmier à Huile en Pays Ebrié" (doctoral dissertation, Ecole Pratique des Hautes Etudes, 1973), pp. 19-26.

²From 1953 to 1963 the price of palm products had varied only $\pm 15\%$ from its arithmetic mean.

³The Ivory Coast boasted the largest agricultural research station devoted to palm trees in French colonial Africa. The station, run by the Institut de Recherches des Huiles et Oléagineux (IRHO) still functions.

oil was of superior quality. To take advantage of this agricultural potential, the Ivorian government established a Palm Plan, placed an existing parastatal--SATMACI--in charge of palm production, and sought outside funding.

Soon, however, SATMACI was superseded by an agricultural state corporation specialized in the palm sector: SODEPALM. International aid donors were funding oil palm projects throughout West Africa during the 1960s, and the Ivory Coast received considerable foreign assistance in expanding palm cultivation and establishing oil mills. Over half of all oil palm hectareage planted during the 1960s and 1970s was planted during the brief period between 1965 and 1970. Roughly three-quarters of the industrial estates were planted during this period and, when they came into production from 1970 onward, the Ivory Coast quickly became one of the world's leading exporters of palm products. Recent annual production of kernals and oil has run between 100 thousand and 150 thousand tons, of which about 50 thousand tons are domestically consumed. At the end of 1979, palm plantations covered approximately 102 thousand hectares.

From 1963 to the mid-1970s the oil palm sector experienced spectacular growth. During the decade following 1963, the cumulative hectareage of oil palm planted under state auspices increased by a factor of twenty-six (see tables 14 and 15). Production from this hectareage rose from about 3 thousand tons of fresh fruit bunches in 1966 to

approximately 627 thousand tons in 1976 (see tables 16 and 17). The number of farmers participating in the village oil palm plantation program grew steadily from 446 in 1963 to 6004 in 1974. Yield per hectare of village oil palm doubled between 1966 and 1974; income per farmer man-day doubled in real terms over the same period (see tables 25 and 26).

Since 1974, annual production has stagnated around 600 thousand tons of fresh fruit bunches, and now lies well below the target levels required to keep pace with oil mill capacity (see tables 17 and 18). In 1979, oil mill capacity utilization averaged fifty-four percent: a financially catastrophic situation, as eighty percent of milling expenses are fixed costs. Even in the now unlikely event that annual output of fresh fruit bunches attains the current target of one million tons in 1985, milling capacity utilization will average only eighty percent. Moreover, the aging trees planted during 1965-1970 will soon become less productive and too tall to harvest. Without an immediate intensive replanting program and an overall increase in oil palm plantations of thirty-one thousand hectares, output will drop precipitously after 1986. The Ivory Coast's oil mills will be gravely underutilized.¹

¹ Bureau d'Etudes Techniques des Projets Agricoles, "Schéma Directeur en Vue de la Réalisation Eventuelle de Nouvelles Huileries de Palme ou de la Rentabilisation de Potentiel Existant" (Abidjan: BETPA, June 1980), pp. ii-iii.

TABLE 14

CUMULATIVE HECTARAGE PLANTED IN OIL PALM
 UNDER SODEPALM 1960-1979
 (Percent change from previous year)

<u>Year</u>	<u>Village</u>	<u>Industrial</u>	<u>Total SODEPALM</u>	
	<u>Plantations</u>	<u>Plantations</u>	<u>Hectares</u>	<u>(% Change)</u>
	<u>Hectares</u>	<u>Hectares</u>		
1960	122 ^a	-	122	107
1961	232 ^a	-	232	90
1962	713 ^a	337 ^a	1,050	353
1963	1,251	1,278	2,529	141
1964	2,028	2,678	4,706	86
1965	3,235	7,164	10,399	121
1966	3,651	13,517	17,168	65
1967	8,974	20,208	29,182	70
1968	12,372	27,383	39,755	36
1969	15,323	33,220	48,543	22
1970	17,617	36,982	54,599	12
1971	19,600	37,846	57,446	5
1972	21,893	41,393	63,286	10
1973	24,272	41,573	65,845	4
1974	26,623	41,672	68,295	4
1975	27,903	43,676	71,579	5
1976	31,858	44,725	76,583	7
1977	34,855	47,424	82,279	7
1978	37,902			
1979	37,902			

Source: SODEPALM, Ministry of Agriculture

^aFrom 1960 to 1962, the palm program was implemented by SATMACI

TABLE 15

TOTAL CUMULATIVE HECTARAGE PLANTED IN OIL
PALM IN THE IVORY COAST 1960-1979

	<u>Total SODEPALM</u>	<u>Total Others</u>	<u>Total Ivory Coast</u>
1960	122 ^a (2%) ^d	5,428 (98%) ^d	5,550 (100%) ^d
1961	232 ^a (4)	6,148 (96)	6,380 (100)
1962	1,050 ^a (13)	6,991 (87)	8,041 (100)
1963	2,529 (25)	7,778 (75)	10,307 (100)
1964	4,706 (36)	8,399 (64)	13,105 (100)
1965	10,399 (54)	8,690 ^b (46)	19,089 (100)
1966	17,168 (66)	8,841 ^b (34)	26,009 (100)
1967	29,182 (75)	9,530 (25)	38,712 (100)
1968	39,755 (79)	10,347 (21)	50,102 (100)
1969	48,543 (82)	10,447 (18)	58,990 (100)
1970	54,599 (81)	13,152 (19)	67,751 (100)
1971	57,446 (81)	13,339 (19)	70,785 (100)
1972	63,286 (86)	10,678 ^c (14)	73,964 (100)
1973	65,845 (86)	11,010 (14)	76,855 (100)
1974	68,295 (86)	11,044 (14)	79,339 (100)
1975	71,579 (87)	11,021 (13)	82,600 (100)
1976	76,583 (87)	11,505 (13)	88,088 (100)
1977	82,279 (87)	11,860 (13)	94,139 (100)

Source: SODEPALM, Ministry of Agriculture

^aPlanted under auspices of SATMACI.

^bEstimate.

^cSODEPALM took over the Plantation Savane de Dabou in 1972.

^dPercent of total hectarage.

TABLE 16
 PRODUCTION OF OIL PALM 1971-1979
 (Thousands of tons of fresh fruit bunches)

	SODEPALM Group			IRHO	Other	Grand Total
	Industrial Plantations	Village Plantations	Total			
1971	151.4	44.7	196.1	34.3	0.9	231.3
1972	267.2	74.5	341.7	36.5	3.6	381.8
1973	288.0	85.8	373.8	34.4	9.0	417.2
1974	437.3	138.7	576.0	40.3	14.5	630.8
1975 ^a	359.6	122.8	482.4	40.4	13.5	536.3
1976	460.0	167.5	627.5	37.5	18.3	683.3
1977	377.2	153.3	530.5	30.8	16.6	577.9
1978	430.7	162.3	593.0	n.a.	14.6	n.a.
1979	396.4	135.5	531.9	n.a.	n.a.	n.a.

Source: BETPA, "Schema Directeur," p. 7. BETPA obtained the data from Palminindustrie.

^aNine months only.

TABLE 17

VILLAGE OIL PALM ESTATES: PRODUCTION
TARGETS AND RESULTS 1966-1979

	Target Production of Fresh Fruit Bunches ^a (Tons)	Actual Production of Fresh Fruit Bunches (Tons)	Actual Production as a Fraction of Target (Percent)
1966 ^b	2,730	2,687	98%
1967	5,367	6,747	126
1968	9,785	9,338	101
1969	16,494	14,435	74
1970	29,120	32,892	113
1971	50,335	44,681	89
1972	76,304	74,530	98
1973	102,200	85,767	84
1974	132,162	138,739	105
1975 ^c	128,664	122,818	96
1976	189,545	167,501	88
1977	215,416	153,301	71
1978	238,711	162,195	68
1979	255,399	135,914	53

Source: Adapted from SODEPALM "Les Plantations Villageoises de Palmier à Huile: Evolution de la Production" (Abidjan: SODEPALM, January 1980), p. 24.

^aThe targets are long term.

^bSODEPALM village oil palm estates only began producing in 1966.

^c1975 is nine months only (January-September).

TABLE 18

INDUSTRIAL OIL PALM ESTATES: PRODUCTION
TARGETS AND RESULTS 1972-1978

	<u>Target Production of Fresh Fruit Bunches^a (Tons)</u>	<u>Actual Production of Fresh Fruit Bunches (Tons)</u>	<u>Actual Production as a Fraction of Target (Percent)</u>
1972	224,536	267,214	119%
1973	n.a.	288,000	n.a.
1974	385,396	437,258	114%
1975 ^b	348,664	359,587	103%
1976	504,334	459,953	91%
1977	522,197	377,163	72%
1978	584,000	431,000	74%

Source: SODEPALM and PALMINDUSTRIE annual reports

^aThe targets used are those for one year in the future. Long term targets were higher.

^bNine months (January-September) only.

No new planting whatsoever was carried out during the 1978-1979 fiscal year; only a small number of palms were planted the subsequent year. It seems quite probable that the Ivorian oil palm sector will face disaster during the late 1980s.

B. The Task

Technical Constraints of Oil Palm Production. While they develop into seedlings, high-yield hybrid oil palms require a complex set of inputs delivered according to a rigorous schedule. Once planted on an estate, their yield becomes less sensitive to variations in inputs. Levels of fertilizer, pesticide, weeding, and rainfall generally affect yield only after a lag of twelve to thirty months.

Oil palms' production cycle lasts about twenty-five years: nine years to reach peak production, a decade of peak harvests, then five years of declining harvests after which the palm must be cut down and a new seedling planted (see table 19). Maintaining a stable level of production requires replanting an annual average of four percent of oil palm hectareage. Since eighty percent of milling costs are fixed, profitable mills must operate at close to capacity, which makes a stable supply of fresh fruit bunches crucial. However, seedlings' lengthy gestation period means that failure to plant new seedlings has no significant effect on output for six or seven years. On the one hand, this makes

it possible to reap artificially high profits in the short term by avoiding investment in replanting. On the other hand, it means that even a crash palm planting program will have no significant effect on production for several years.

Oil palms produce fresh fruit year-round. Harvests fluctuate somewhat over the months,¹ but assuring an even supply of oil palm fruit is not difficult. The fruit, however, must be milled within twenty-four hours of harvesting, or it becomes acidic. Harvest and transportation of the fresh fruit bunches from plantation to mill is an exacting operation, and plantations must be located close to the mill. Storing fresh fruit bunches in a buffer stock to smooth the input of raw material to the mill is out of the question.

The financial resources at stake in an oil palm program and the high proportion of fixed expenses in milling costs make it crucial for an oil palm parastatal to control the production of oil palm fresh fruit. Large industrial oil palm estates with laborers recruited chiefly from the savannah region to the North would have provided the surest supply of fresh fruit. However, the Ivorian government held a strong

¹See table 20.

TABLE 19
 PRODUCTION CYCLE OF OIL PALM
 IN THE IVORY COAST

Year	Tons of Fresh Fruit Bunches per Hectare		Observations
	Industrial Estates	Village Estates	
1	0	0	Seedlings are planted in year 1
2	0	0	
3	0	0	
4	2.9	2.1	Increasing harvests
5	6.3	4.9	
6	8.8	6.8	
7	12.1	9.1	
8	14.3	10.7	
9 to 18	15.4	11.5	Peak harvests
19	15.3	11.4	Increasing difficulty in harvesting palms
20	15.1	11.3	
21	14.4	10.8	
22	13.0	9.7	
23	11.2	8.3	
24	0	0	Palms cut down

Source: BETPA, "Schéma Directeur," p. 18. Translated and slightly adapted by the author.

TABLE 20

FLUCTUATIONS IN DELIVERIES OF FRESH FRUIT BUNCHES
TO THE ELOKA OIL MILL 1968-1972 (tons)

Ten-Day Periods	1968	1969	1970	1971	1972
1	43.80	285.50	579.20	127.55	406.0
2	217.00	166.30	875.65	-	723.0
3	256.35	498.50	836.50	-	833.0
4	304.30	332.65	1,234.10	379.75	1,105.0
5	713.35	796.95	1,102.40	824.45	1,248.0
6	510.25	768.60	1,152.50	1,201.10	1,041.0
7	395.10	573.40	1,272.50	841.55	-
8	498.70	981.85	1,782.30	1,164.75	575.0
9	468.75	514.95	2,235.45	1,980.65	1,463.0
10	812.55	794.70	1,927.30	1,433.25	2,273.0
11	591.00	762.95	2,617.70	2,139.75	1,937.0
12	879.85	928.75	2,579.80	1,007.00	2,529.0
13	901.60	433.75	1,554.70	1,706.25	2,743.0
14	650.80	830.05	1,891.85	1,597.45	2,421.0
15	715.15	944.55	2,230.30	1,613.50	3,093.0
16	697.60	876.15	2,295.15	1,443.00	2,005.0
17	881.35	711.55	1,816.60	1,508.95	1,597.0
18	676.70	991.35	1,465.30	1,425.50	1,059.0
19	470.30	503.25	1,299.20	1,215.90	1,550.0
20	571.35	401.45	1,041.80	849.10	949.0
21	679.20	538.20	828.65	346.30	999.2
22	338.30	514.90	778.30	1,598.85	726.9
23	410.30	519.45	772.75	701.10	916.8
24	329.00	513.65	732.85	1,038.10	802.5
25	404.15	828.25	1,081.35	685.58	992.7
26	373.00	608.70	1,006.95	1,114.95	752.3
27	604.85	788.65	1,291.75	624.40	583.7
28	439.35	550.80	1,198.50	818.85	714.4
29	533.95	785.60	920.55	787.35	927.5
30	808.50	752.80	471.25	681.30	1,188.3
31	714.05	681.45	723.55	916.95	764.3
32	814.45	849.10	1,065.05	585.70	1,177.7
33	536.90	717.10	1,132.25	683.10	357.3
34	746.70	642.60	585.30	-	-
35	540.35	611.60	322.10	-	-
36	424.45	674.65	487.60	-	-

Source: Pillet-Schwartz, "Etat et Développement Rural,"
p. 120.

commitment to raising the incomes of Ivorian peasants.

The compromise between financial and social objectives was to situate each mill in the center of an industrial estate that would produce a reliable minimum of fresh palm fruit. Surrounding the estate were village oil palm plantations, cultivated by the local peasantry. Initially, SODEPALM intended to recruit local farmers to work on the industrial estates. After the farmers had spent several years on the plantation, demonstrating their commitment and accumulating a sizable sum of withheld earnings, the industrial plantation was to be subdivided and distributed to the farmers. However, local Ivorians were unattracted to the rigorous schedule of plantation labor, and the plantation workforce was and is composed primarily of migrants from Upper Volta and Mali. Thus, the initial structure of an industrial estate with a hired workforce surrounded by Ivorian smallholders has endured. Until 1978, when Palminindustrie and SODEPALM were formally separated, each mill, plantation, and surrounding smallholdings formed a single administrative unit.¹ Since the dissolution of

¹Although ostensibly extension work in the villages was carried out by the social welfare part of SODEPALM that was legally outside the SODEPALM Group, the extension network's headquarters were, in fact, located in the oil mill complexes and coordination between the industrial estates and the smallholder program was extremely close.

SODEPALM/Palminindustrie, the industrial estates have been run quite separately from the surrounding smallholdings.

The Production Process. Producing processed palm products begins with agricultural and industrial research. Obtaining the high yields possible with hybrid palms requires carefully raising seedlings, properly preparing land for the future palm estate, correctly planting the seedlings and protecting them with grillwork from rodents, timely application of fertilizer and insecticide, reliable weeding, reliable harvesting, reliable collection of fresh fruit bunches, and rapid transportation to the mill. The fruit must be carefully processed and then the oil and kernals marketed (see table 21).

In the village palm plantations, the palm parastatal had to rely on farmers for properly preparing their land, properly tending the young palms, and properly harvesting the fruit. To protect itself from the uncertainty such dependency on farmers implied, the palm parastatal also cultivated its own industrial plantations.

Agricultural research, technical assistance, and seedlings of high quality have been reliably provided by IRHO to both village and industrial palm plantations. The palm parastatals have, indeed, benefited from their dependence on IRHO for these key inputs. The SODEPALM Group had its own industrial research and development department. After the

Group's liquidation, this department was spun off into the legally independent Institute for Tropical Technology (ITT).¹

SODEPALM and the SODEPALM Group cleared land for industrial palm estates and, during the 1960s and early 1970s also successfully sub-contracted some land clearing. Smallholders cleared their land themselves.² The palm parastatals provided both industrial and village plantations with young palms, grillwork to protect the palms' roots from rodents, and fertilizer. Resident IRHO experts gave technical assistance in diagnosing and treating plant disease on the industrial estates. Insecticide, provided by the palm parastatal and applied by aerial crop dusting, was confined to the industrial estates.

The palm parastatals closely controlled harvesting in the industrial estates. Harvesting in the rural areas was more uncertain, and collection of the fruit required a system of rural feeder roads. The SODEPALM Group's civil engineering brigade extended and maintained this road network. Once the Group was dissolved, SODEPALM had to rely upon MOTORAGRI, another state corporation, to implement the program of rural roads. By the mid 1970s, national develop-

¹The ITT's offices remain in the SODEPALM headquarters building, and coordination between the palm parastatals and the ITT appears to be close.

²Some land for coconut smallholdings was cleared by SODEPALM, but none was cleared for oil palm smallholdings.

ment priorities had shifted to the North, and MOTORAGRI had few resources for the low priority palm program. Despite a government pledge to bulldoze 298 kilometers of new rural roads in 1977/1978, no new roads at all were constructed. In 1979/1980, SODEPALM experts calculated that simply to collect fresh fruit bunches from isolated plantations already in production would require 654 additional kilometers of rural roads. The maximum SODEPALM could anticipate for 1979/1980 was 100 kilometers; the parastatal was unsure that MOTORAGRI would carry out even that minimal project.

The Group transported the harvested fruit from the village estates to the mill. After the Group's liquidation, SODEPALM briefly managed the transportation; then Palmindustrie took over the task for both industrial and village estates. Palmindustrie also maintains the rural road network. Managing the oil mills has always been the palm parastatals' responsibility.

The SODEPALM Group marketed its processed palm products through a private corporations, SOGESCOL, that held equity in Palmivoire and Palmindustrie. Blohorn, another shareholder, was the primary purchaser and, in turn, the SODEPALM Group was Blohorn's priority supplier. Although purchasers of the Group's output paid the current world market price, the Group

TABLE 21

ORGANIZATIONS AND INDIVIDUALS PARTICIPATING
DIRECTLY IN THE PARASTATAL PALM OIL INDUSTRY:
THE SODEPALM GROUP AND THE CURRENT SITUATION

Activity	SODEPALM Group		SODEPALM	Palindustrie
	Village Estates	Industrial Estates	Village Estates	Industrial Estates
Agricultural Research	IRHO	IRHO	IRHO	IRHO
Developing Seedlings	IRHO	IRHO	IRHO	IRHO
Preparing Land	farmer	Group	farmer	Palindustrie
Grillwork, Fertilizer, Insecticide ^a	SODEPALM	Group	SODEPALM	Palindustrie
Planting and Cultivating Palms	farmer	Group	farmer	Palindustrie
Harvesting	farmer	Group	farmer	Palindustrie
Rural Feeder Roads	Group	-	MOTORAGRI	-
Transportation of ffbs.	Group	Group	Palindustrie ^b	Palindustrie
Processing	Group	Group	Palindustrie	Palindustrie
Marketing	Group/SOGESCOL	Group/SOGESCOL	CSSPPA	CSSPPA

Source: Compiled by the author.

^aIRHO experts assisted in detecting and diagnosing plant disease.

^bSODEPALM was in charge of transportation from 1976 to 1978.

received a stabilized price from the CSSPPA.¹

From 1976 onwards, the Stabilization Fund took over all marketing activities. It paid the palm parastatals a negotiated price which was intended to permit them to break even. In fact, it was not until 1977/1978 that the price included the variable and fixed cost components necessary to ensure that the parastatals' income covered their costs.

C. The Village Estates: Oil Palm Production as a Joint Venture

Peasants and SODEPALM shared the responsibilities of cultivating oil palm on the smallholdings. SODEPALM provided most of the cash, material, and technical inputs; the peasants supplied land and labor (see table 22). Peasants enrolled in the program in the hope of raising their cash income; they complied with SODEPALM's regulations for several reasons.

At the initial stage of cultivating palms, SODEPALM exerted considerable leverage over the farmer. If the smallholding was improperly prepared, the SODEPALM extension

¹Any difference exceeding ten percent between the market price and the previous year's average price was absorbed by the Stabilization Fund. During the tenure of the Group, the Fund made a surplus from sales of palm products of 8.7 billion CFA.

TABLE 22

DIVISION OF LABOR BETWEEN SMALLHOLDER
AND SODEPALM FOR CULTIVATING OIL PALM

Year	Farmer	SODEPALM
0 (Year of planting palms)	<ul style="list-style-type: none"> - Clearing land - Preparing land for seedlings - Sowing cover crop - Planting seedlings - Tending crops 	<ul style="list-style-type: none"> - Layout and spacing of seedlings - Provision of seeds for cover crop - Provision of palm seedlings - Provision of fertilizer - Provision of grillwork
1	<ul style="list-style-type: none"> - Weeding - Spreading Straw - Applying fertilizer - Maintaining "rounds" of bare earth around each palm 	<ul style="list-style-type: none"> - Giving technical advice - Providing fertilizer - Supervision
2	<ul style="list-style-type: none"> - Weeding - Spreading straw - Applying fertilizer - Maintaining "rounds" 	<ul style="list-style-type: none"> - Supervising operations - Giving advice - Providing fertilizer - Checking for plant disease
3	<ul style="list-style-type: none"> - Weeding - Applying fertilizer - Maintaining "rounds" 	<ul style="list-style-type: none"> - Supervising operations - Giving advice - Providing fertilizer - Checking for plant disease
4	<ul style="list-style-type: none"> - Same as year 3 - Plus: harvesting and transporting ffbs. to roadside 	<ul style="list-style-type: none"> - Same as year 3 - Plus: collecting ffbs.

Source: Translated and adapted from SODEPALM, "Les Plantations Villageoises," p. 15

agent simply withheld palm seedlings.¹ Once the smallholder had planted his seedlings, SODEPALM's coercive authority was minimal. Extension agents could cajole and admonish recalcitrant farmers; the parastatals showed films and even organized trips for wayward farmers to see the plantations of their more competent and industrious colleagues. Farmers' primary motivation for maintaining and harvesting, however, was financial.

When peasant oil palms attained peak production, revenues per man-day devoted to oil palm compared favorably with both the minimum agricultural wage and revenues possible from alternative crops (see tables 6 and 7). Moreover, oil palms produce fruit throughout the entire year, assuring the cultivator of a steady stream of income. In the rural Ivory Coast, where credit is scarce and expensive, a regular source of cash offers strong attractions. Blume (1971), in fact, argues that producer prices were set higher than necessary for farmer cooperation.

In addition, SODEPALM subsidized a large proportion of the cost of establishing smallholdings. The subsidy varied: between 1963 and 1980, seven different schemes were utilized

¹In practice, this procedure was occasionally violated by planters who could exert leverage over the extension agents. The author observed one case in which extension agents permitted the local doctor to establish an estate without properly clearing his land, in return (presumably) for reliable medical services.

for individuals and cooperatives planting coconut and oil palm.¹ The most widespread subsidy per hectare for individual smallholders (in effect during the 1960s and early 1970s) was 65,800 CFA out of a total cost of 143,800 CFA. Smallholders received a cash advance of 20,000 CFA per hectare to cover the costs of clearing and tending their palm plantation. They had a six year grace period before they had to begin repayment of their 78,000 CFA/hectare debt to SODEPALM. By that time, their palms would normally be producing close to peak harvests. Thus, participation in the palm program did not require smallholders to make a net cash outlay in any year.

During the 1960s and early 1970s, price incentives were adequate to encourage widespread enrollment in the palm program. Since then, the government prices of fresh oil palm fruit and coconuts have fallen relative to alternatives.² Few farmers are now planting oil palm.

¹For a meticulous description of the various subsidy schemes, see: SODEPALM, "Plantations Villageoises," Annex, pp. 1-5.

²The major alternatives are: selling on parallel markets (see figure 16), cutting the palms and selling the fermented sap as palm wine, and cultivating alternative crops. Oil palm growers generally have the option of switching to garden vegetables or forest tree crops (coffee, cocoa, rubber). Coconut palm thrives on poor sandy soil unsuited for most other cash crops, so coconut cultivators usually cannot substitute another crop for their unprofitable coconut palms.

FIGURE 16

A PARALLEL MARKET
FOR OIL PALM FRUIT



Source: Fraternité Matin (28 May 1980).

Scene: A marketplace.

Government Agent: "But you, SODEPALM farmer--this is where you are selling your palm nuts??!!"

Farmer: "Yes! If the government won't pay well, what else can I do?"

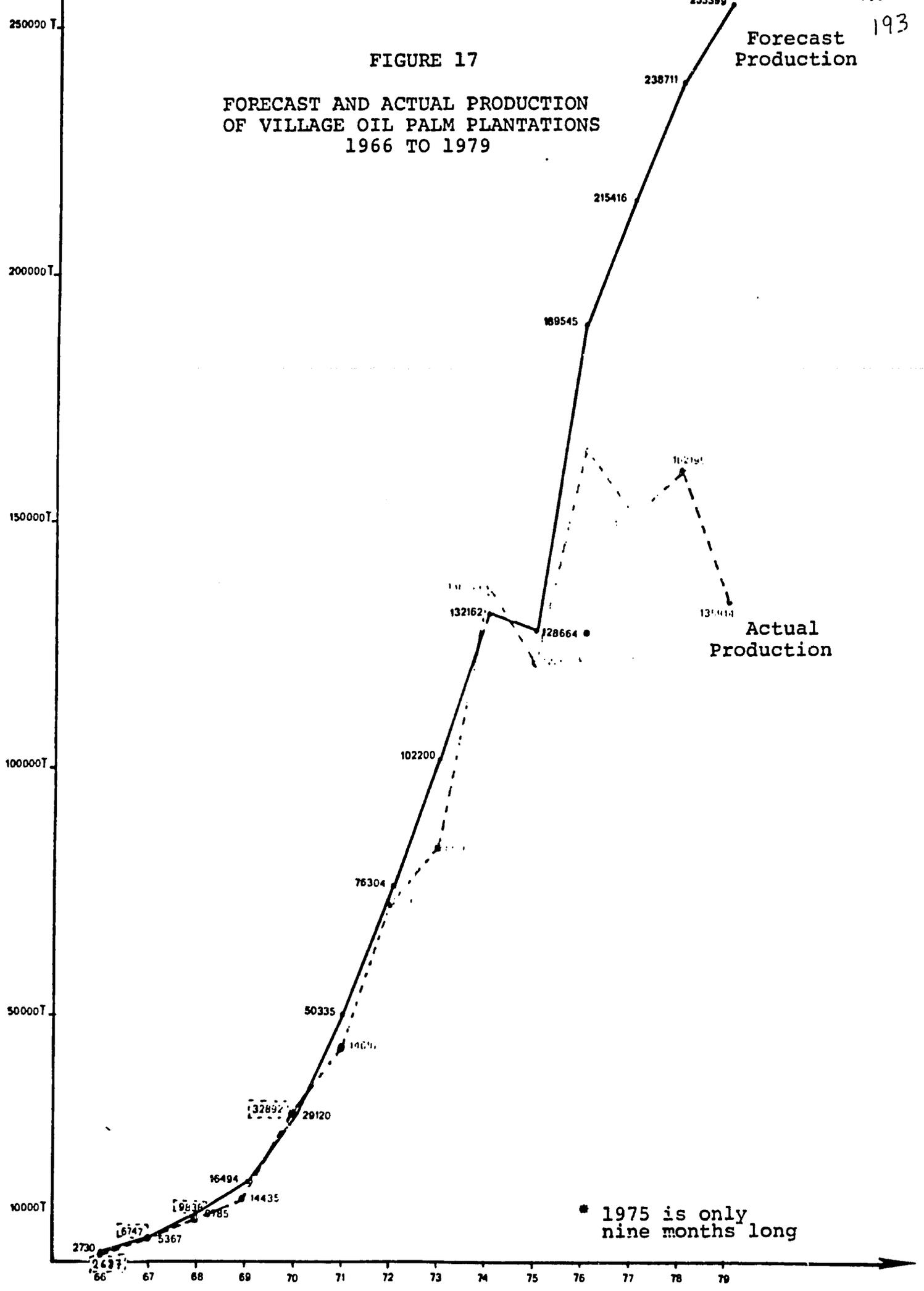
For the period 1966-1975, planned production of village smallholdings lay within four percent of long range forecasts. From 1976 onwards, production fell increasingly below projections, plummeting to 53.2% of forecast in 1979 (see figure 17). The shortfall of around 110,000 tons in 1978/1979 between actual and planned village plantation output of fresh fruit bunches resulted from several factors, including drought, halt to the program of rural feeder roads permitting access to plantations already entering into production, and the abandonment or destruction of existing plantations (see table 23).

Plantations were destroyed chiefly for housing, construction, and public works projects. This centered around the greater Abidjan area, where the city's expansion has driven up land values. Oil palm has a high return per man-day but a low return per hectare, and is no longer economical within Abidjan's rapidly expanding perimeter.

D. The Impact of the Palm Program on Smallholders

The Industrial Estates. Industrial estates had a mixed impact on farmers. The estates provided the revenue and the reliable output of fresh fruit bunches that was crucial to the palm program's financial survival. However, the estates in the Southwest region surrounded existing villages, depriving them of sufficient land for their traditional slash and burn agriculture. The villages were, according to

FIGURE 17
FORECAST AND ACTUAL PRODUCTION
OF VILLAGE OIL PALM PLANTATIONS
1966 TO 1979



* 1975 is only nine months long

TABLE 23
 SOURCES OF PRODUCTION SHORTFALL FOR
 1978/1979 OF 110,000 TONS OF
 FRESH FRUIT BUNCHES

<u>Item</u>	<u>Tons of ffbs. lost</u>	<u>Percent of total loss</u>
Drought	50,000	45%
Isolated plantations	20,700	19
Destroyed and/or abandoned plantations	19,900	18
Height of trees	9,200	8
Sales on parallel markets	7,500	7
Parasites	<u>3,000</u>	<u>3</u>
Total	110,000	100

Source: SODEPALM, "Plantations Villageoises," p. 29.

Note: The total is an estimate and is not an exact sum of the items.

Schwartz (1979:69), rapidly "asphyxiated". The extremely scanty literature on oil palm in the Southeast makes no mention of this problem.

The Village Estates. The village estates program directly channeled almost 9 billion CFA to smallholders in payment for their fresh fruit bunches delivered during the period 1966-1979. Deducting their debt service to SODEPALM of 580 million CFA before cash payments for tools, fertilizer, and field-hands leaves 8.4 billion CFA (see table 24). Measured in terms of injecting capital into rural areas, the SODEPALM village plantation program is a clear success.¹

The SODEPALM program also successfully increased farmers' implicit wage rate. Gross revenue per man-day devoted to oil palm in full production rose from an average of 451 CFA in 1966 to 2100 CFA in 1974, after which (1975-1979) it stabilized around 1500 CFA per man-day. In constant terms, average gross income per man-day rose by about one-quarter between the periods 1969-1973 and 1975-1979 (see table 25).

This long term trend, however, masks the fact that there were two distinct periods. From 1966 to 1974, average yield per producing hectare, average revenue per farmer, and average

¹There is no data to determine the revenue foregone from coffee and cocoa that was replaced by oil palm. At the national level, little revenue was probably sacrificed. The Ivory Coast has produced close to its quota of both coffee and cocoa. Much further expansion in these crops would have been unmarketable.

TABLE 24

AVERAGE PRICE OF FRESH FRUIT, GROSS REVENUE, DEBT SERVICE,
AND NET REVENUE OF SODEPALM SMALLHOLDERS

Fiscal. Year	Average ^b Price per kilo of ffb. (CFA)	Value of ffbs. (millions of CFA)	Peasants' Cost of Servicing Debt to SODEPALM ^e (millions of CFA)	Net Value of ffbs. After Debt Service (millions of CFA)	Average net price per kilo of ffb. (CFA)
1966 ^a	4	10.7		10.7	4
1967	4	27.0		27.0	4
1968	4	39.4		39.4	4
1969	4	57.5		57.7	4
1970	4	131.6		131.6	4
1971	4	178.7	2.3	176.4	3.9
1972	4.6	339.9	7.5	332.4	4.5
1973	5.2	446.7	12.6	434.1	5.1
1974	9 ^c	1,260	32.1	1,227.9	8.9
1975 ^d	8	983	56.8	926.2	7.5
1976	8	1,340	85.6	1,254.4	7.5
1977	10	1,226	109.8	1,116.2	7.3
1978	10	1,622	128.4	1,493.6	9.2
1979	10	1,359	145.5	1,213.5	8.9
Total	-	8,944.6	580.6	8,364.0	-

Source: SODEPALM, SODEPALM Group, SODEPALM/PALMINDUSTRIE. Annual reports, various years.

^a1966 was the first year that SODEPALM smallholders sold fresh fruit bunches (ffbs.).

^bThe average price is derived by dividing value by tonnage.

^cThis derived price is an anomaly: higher than the price of 8 CFA/kilo ffbs. that SODEPALM states was in effect during 1974. The probable explanation is that the productivity bonuses were paid to farmers in the year following the actual harvests. Thus, farmers in 1974 received not only the new high price of 8 CFA/kilo ffbs., but also their bonuses for harvests in 1973. The average "pre-bonus" price of ffbs. in 1974 was, indeed, 8 CFA/kilo.

^dFiscal year 1975 was only nine months long.

^eThe loan was 78,000 CFA per hectare. It was interest free with a grace period of six years, after which payments were: N7 = 3,000 CFA; N8 = 5,000 CFA; N9 = 7,000 CFA; N10 to N16 = 8,000 CFA; N17 = 7,000 CFA. It is assumed that no peasants default on their debt.

TABLE 25

SODEPALM SMALLHOLDER PROGRAM
NUMBER OF FARMERS, GROSS REVENUE PER FARMER
AND PER MAN-DAY 1966-1979

Year	Number of Farmers Participating	Gross Revenue Per Farmer (current CFA) ^a	Gross Revenue Per Man-Day (current CFA) ^b	Gross Revenue Per Man-Day (constant 1969 CFA) ^c
1966	1,573	36,677	451	-
1967	2,381	60,919	647	-
1968	3,163	55,348	585	-
1969	3,840	59,159	540	540
1970	4,106	84,448	703	672
1971	4,533	75,634	612	562
1972	5,077	107,461	808	696
1973	5,621	120,275	857	693
1974	6,004	306,122	2,100	1,652
1975	6,217	215,051	1,473	995
1976	7,270	270,107	n.a.	n.a.
1977	7,846	223,927	1,484	828
1978	8,582	270,243	1,790	908
1979	8,582	218,594	1,432	660

Source: The data are from annual reports of SODEPALM, the SODEPALM Group, and SODEPALM/Palmindustri.

^aOnly farmers actually harvesting are included in this calculation.

^bMan-days per year are calculated as follows:

22 man-days per year for maintenance (World Bank estimate)

2 man-days per year per ton of fresh fruit harvested

Tons of fresh fruit per farm per year is derived by dividing total tonnage by the number of farmers harvesting.

^cThe Ivory Coast had no rural consumer price index until very recently. Price deflators used are BETPA estimates except for rural inflation during 1978-1979, which is arbitrarily estimated to be ten percent. Price deflators before 1969 for rural areas are too unreliable to be of much use.

revenue per man-day increased in both current and constant CFA francs. Since then, all these indices have stagnated or fallen. In constant CFA francs, gross revenue per man-day in 1979 was less than half the level in 1974.

Even during its heyday, the oil palm parastatal did not significantly improve the welfare of its target population, the impoverished local peasants. After an extensive investigation of the Ebrié region surrounding the Eloka oil mill and industrial estate, Pillet-Schwartz (1973) concluded that SODEPALM had failed to ameliorate rural income distribution, cultivation techniques, or peasant incomes. Pillet-Schwartz's (1973:166) data show that the larger and more profitable plantations' proprietors tend to be urban or semi-urban, not local farmers. The average urban and semi-urban resident's village estate was 7.39 hectares, versus an average of only 3.84 hectares for the local peasants' smallholdings. Yields were significantly higher on estates whose proprietors had important non-agricultural sources of income than they were on the plantations of local farmers.¹

In spite of SODEPALM's efforts to modernize peasant agriculture, Ebrié farmers generally adopted oil palm without altering their traditional pattern of social activity. Ebrié

¹Local farmers' yields averaged only sixty-six percent of SODEPALM's projections; the yields on estates owned by urban and semi-urban residents were an average of seventy-eight percent of projections. See: Pillet-Schwartz, "Etat et Développement Rural," p. 228.

men customarily devoted only about one-sixth of their day to agriculture. Rather than augmenting the total amount of time they spent on cultivation, local peasants who adopted oil palm simply spent less time on their other crops, or--their preferred solution--hired field hands. Employing agricultural laborers had paid handsome dividends in coffee and cocoa cultivation. Unfortunately, the returns per hectare of oil palm make field hands uneconomical on all but the largest holdings. Furthermore, laborers for oil palm must work year round: a more expensive proposition than hiring laborers for a few months to help cultivate and harvest coffee or cocoa during the peak season.

A single field hand earned about 36 thousand CFA per year in 1972, more than the average gross revenue that year for a hectare of producing oil palm (see table 35). Thus, a disproportionate share of the funds paid by SODEPALM to peasants for their fresh fruit bunches went either to pay field hands or to the urban or semi-urban proprietors of the large estates. Pillet-Schwartz (1973:175) indeed describes the case of a local peasant who went deeply into debt in order to pay his oil palm plantation laborers.¹

¹See also: Pillet-Schwartz, "Etat et Développement Rural," pp. 174-176, 382-385.

TABLE 26
 SODEPALM SMALLHOLDER OIL PALM PROGRAM
 AVERAGE YIELD AND REVENUE PER HECTARE IN PRODUCTION
 1966-1979

Year	Hectares in Production	Yield of ffbs. (tons per hectare) ^a	Revenue (CFA per hectare)
1966	701	3.8	15,330
1967	1,227	5.5	21,994
1968	1,979	4.9	19,885
1969	3,144	4.6	18,365
1970	5,501	5.9	23,917
1971	8,592	5.2	20,801
1972	12,372	6.0	27,473
1973	15,323	5.6	29,152
1974	17,643	7.9	71,416
1975	19,630	6.3	50,076
1976	n.a.	n.a.	n.a.
1977	24,302	6.3	50,449
1978	26,652	6.1	60,858
1979	27,903	4.9	48,704

Source: Annual reports, SODEPALM, SODEPALM Group, SODEPALM/
 Palmindustrie

^aThis is a derived figure: total ffb. tonnage ÷ number
 of hectares in production.

XI. PARASTATALS IN THE OIL PALM SECTOR:

SODEPALM AS AN ORGANIZATION

A. Institutional History

The institutional history of the Ivorian palm sector since independence falls into five distinct periods (see table 27). From 1960 to 1963, oil palm production was the responsibility of SATMACI, a state corporation engaged in multifarious agricultural and rural development activities. The size of planned expansion in the oil palm sector, however, rapidly exceeded SATMACI's administrative capacity.

TABLE 27

PRIMARY INSTITUTIONS IMPLEMENTING THE IVORIAN PALM PROGRAM 1960-1980

<u>Period</u>	<u>Institutions</u>
1960-1963	SATMACI
1963-1969	SODEPALM
1969-1976	SODEPALM/Palminindustrie/Palmivoire (the "Group")
1976-1978	SODEPALM/Palminindustrie (unified management)
1978-1980	SODEPALM, Palminindustrie (separate)

Source: Compiled by the author.

In 1963, the government created a state corporation, SODEPALM, that specialized in the palm sector. From 1963 to 1969, SODEPALM effectively implemented a massive oil palm

planting program. Coconut palm was added to SODEPALM's responsibilities in 1967. Processing the future production of the newly planted palms required constructing and then operating a cohort of mills: a tremendous technical and financial task. To obtain the expertise and capital needed for this endeavor, the government sought assistance from the private sector and from international creditors. However, the government had no intention of relinquishing control over either the rural development aspects of the palm program or the major capital accumulation represented by the planned oil mills and industrial palm plantations. After lengthy negotiations with international creditors and private corporations involved in the oil palm sector, the government entered into an association with them--the SODEPALM Group--with three subunits: SODEPALM, Palmindustrie, and Palmivoire.

The association let the government retain control over the village plantations and rural development by dividing the SODEPALM subunit legally and financially into two parts. One set of activities (chiefly financing and ownership of the industrial oil palm estates) SODEPALM undertook as a member of the Group; SODEPALM's rural development and social welfare activities were outside the Group. SODEPALM remained a state corporation.

Palmindustrie provided the government with a means of involving the private sector, yet retaining control over the Group's massive capital investments. It was set up as a

joint venture in which the government was majority shareholder. Palminindustrie functioned chiefly as a holding company, with title to the major capital investments (warehouses and oil mills), which it rented to the Group.

Palmivoire, a joint venture with minority government participation, coordinated the Group's overall activities and managed the industrial and commercial aspects of the palm program. From 1964 to 1976, the SODEPALM Group implemented an oil palm program that was vertically integrated from the plantation to marketing the processed palm products.

In 1974, the government decided to buy out the private corporations participating in the SODEPALM Group. Negotiations lasted two years. The result, in 1976, was the liquidation of Palmivoire and the creation of a new fully public association: SODEPALM/Palminindustrie. Palminindustrie became a state corporation, but retained its role as a holding company. SODEPALM assumed most of Palmivoire's management functions. Marketing responsibility, however, was transferred to the Stabilization Fund, and the government took control of the association's international loan portfolio.

Palminindustrie and SODEPALM were formally separated in 1978.¹ SODEPALM became an agricultural extension agency

¹See: decree 78-296 of 5 April 1978, in JORCI (1978), p. 872; and Ministère de l'Agriculture, Direction de la Programmation et de la Budgetisation et du Contrôle de Gestion, "Traite de Réstructuration des Sociétés SODEPALM et PALMININDUSTRIE; Project" (Abidjan: Ministry of Agriculture, 15 October 1978).

devoted to smallholder cultivation of oil palm, coconut, rice, manioc, and other crops in the southern forest zone and littoral. Palminindustrie managed the transportation and processing of oil palm and coconut. The Stabilization Fund retained marketing responsibility, and the government continued to control international borrowing.

During 1979 and 1980, plans were afoot to sell part of Palminindustrie's equity to private corporations. For a time in 1980 it seemed likely that a private corporation would be hired to manage Palminindustrie. However, the government ultimately decided against both of these options, and the palm parastatals remained fully public state corporations.

B. Autonomy

The formal structure of government control was relatively stable throughout the tenure of SODEPALM and the SODEPALM Group. The government exercised tight control over the board of directors by: (1) specifying the institutions' mandates in a written decree; (2) choosing the majority of board members; and (3) delegating representatives to oversee board meeting, suspend doubtful decisions for a one month period of review by the Minister, investigate company activities, and audit the corporate accounts. In the case of SODEPALM, the Minister of Economy, Finance, and Planning and later the Minister of Agriculture could veto any decision taken by the board.

Most operating decisions, however, were taken not by the board but by the chief executive officer who exercised considerable discretion. For the first decade, 1963-1973, the chief executive officer was a Frenchman; his Ivorian successor was a senior SODEPALM employee, and was equally independent. The elaborate apparatus of government administrative control in fact left SODEPALM and later the SODEPALM Group considerable latitude for independent action.

SODEPALM: 1963-1969. Government control over the original SODEPALM was set out by decree in 1963.¹ Together, the Ministry of Agriculture and the Ministry of Economy, Finance, and Planning selected five of the ten members of the board of directors (conseil d'administration), and jointly chose the chief executive officer (directeur général). Three of the remaining board members represented other government institutions (the National Assembly and the Economic and Social Council). All of these eight members were state administrators (administrateurs d'Etat) and their nomination to the board required approval from the Ministry of Agriculture. The last two board members were technical experts: a representative of agricultural research (IRHO), and of the domestic palm oil processing industry (the president of Blohorn).

Decisionmaking by the board was tightly circumscribed.

¹Decree 63-463 of 7 November 1963.

The board of directors' discretion was spelled out by a specific list of areas in which they had the competence to make a decision. All board decisions had to be communicated to the Minister of Agriculture within one week, and did not become binding until the Minister had had one month to consider (and perhaps veto) the decision. A state comptroller (controleur d'Etat) representing the Minister of Economy, Finance, and Planning attended all board meetings. The comptroller had access to all corporate documents and received all financial information at least one week prior to the relevant board meeting. Furthermore, the comptroller held the power to suspend any decision by the board for one month in order to notify the overseeing ministries.

Technical and financial supervision was assured in several ways. A technical committee (comité technique) controlled by the Ministries of Agriculture and of Economy, Finance, and Planning evaluated SODEPALM's technical performance. Government auditors annually verified SODEPALM's accounts.¹

The SODEPALM Group: 1969-1976. . Formal government control

¹In theory, so did the Chamber of Accounts of the Ivorian Supreme Court. In practice, this regulation remained a dead letter. The National Assembly received a copy of SODEPALM's annual budgets, but the Assembly had no real authority over SODEPALM, and their approval of the budget was pro forma.

over the SODEPALM Group was looser than that over its predecessor. The Group's official mandate was much broader: it had the authority to: (1) study and evaluate any project concerning oil palm, coconut palm, and related industries; and (2) cultivate oil palm and coconut, process the fruit, and market the finished products. The power of the state comptrollers and government commissaries was severely reduced by the 1970 legal reforms of the parastatal sector. Furthermore, any formal changes in the SODEPALM Group's legal structure required prior approval from the Group's major international creditors.

All government representatives on the various boards were state administrators whose appointments required ratification by the Minister of Agriculture alone (SODEPALM) or jointly with the Minister of Economy and Finance (Palminindustrie, Palmivoire). Although the government dominated most of the Group's decisionmaking at the level of boards of directors, it did not hold an absolute majority on every board. The three boards of directors in which the state directly controlled the majority of seats (SODEPALM, Palminindustrie, the Group) freely elected their chairman (see table 28). The board of Palmivoire was (in theory) dominated by the private

sector.¹ In this case, the chairman had to be one of the government's representatives on the board. The chairman selected the chief executive officer of both Palminindustrie and Palmivoire. The chief executive officer of SODEPALM was chosen by the Minister of Agriculture.

TABLE 28
THE SODEPALM GROUP
COMPOSITION OF BOARDS OF DIRECTORS

	<u>SODEPALM</u>	<u>Palminindustrie</u>	<u>Palmivoire</u>	<u>Group</u>
State	8	6	4 (6) ^a	5
Private sector	2	4	8 (6) ^a	4
Total	10	10	12	9

Source: SODEPALM Group annual reports, various years.

^aThe chief executive officers of SONAFI and SOCIPEC are listed as representatives of the state.

In addition to control exercised by the Ivorian government, international creditors supervised the Group's

¹In fact, the largest "private sector" shareholder in Palmivoire was SONAFI, an Ivorian state corporation. The chief executive officer of SONAFI sat on Palmivoire's board. Another board member representing the private sector was the chief executive officer of SOCIPEC. However, SONAFI owned 82.6% of SOCIPEC's equity. Adding to these two members the four official government representatives on the board reveals that the government directly or indirectly controlled six out of the twelve seats on Palmivoire's board, including the position of chairman.

activities. The SODEPALM Group was created partly to obtain three sizable loans: 2.25 billion CFA from the European Investment Bank, 2.2 billion CFA from the CCCE, and 4.85 billion CFA from the World Bank. In return for the funds, the Group had to obtain these lenders' approval for all new projects, all new long-term debt, and all changes in the parastatals' legal structures. Any violation of this agreement gave the creditors the right to demand immediate payment of outstanding interest and principal. Paradoxically, these creditors' supervision increased the Group's independence. The Group's financial success led to lax enforcement of the rules concerning new projects and new long-term debt, while the final provision restrained the government from making sudden unilateral changes in the Group's structure.

Financial Control. The independence of the chief executive officers of SATMACI, SODEPALM and later the SODEPALM Group depended not only on the formal legal structure of government supervision, but also (and perhaps primarily) on the parastatals' reliance on government funds. SATMACI depended almost exclusively on government allocations. SODEPALM obtained a large influx of capital from international donors and lenders, which gave it significantly greater autonomy than SATMACI had possessed. The SODEPALM Group depended on the Ivorian government for only thirty-two

percent of the funds for the palm program (see table 29). As profits from oil palm production rapidly rose during the early 1970s, the SODEPALM Group achieved almost complete financial independence. It functioned like a "state within a state."

From 1974 onwards, the government began tightening control. In 1976, the government bought out the private sector shareholders in the SODEPALM Group, eliminating the formal decisionmaking autonomy from the government that had stemmed from the participation of the private sector and international creditors. Palmivoire was liquidated, and SODEPALM/Palmindustrie's financial autonomy was severely curtailed: it lost control of both foreign funds and profits from the sale of processed palm products. The new palm parastatals had to submit highly detailed budgets to the Ministry of Agriculture and then patiently await funds. As the SODEPALM Group was gradually dismantled, the separate pieces lost the capacity to control a wide range of production decisions that the former vertically integrated conglomerate had possessed.¹ The new isolated institutions had to rely upon the Ministry of Agriculture to coordinate their activities.

¹By 1980, SODEPALM/Palmindustrie was split into two fully independent state corporations. The technological research and development department of the former Group had become the independent Institute of Tropical Technology.

TABLE 29
 SOURCES OF CAPITAL
 FOR PLANNED PALM PROGRAM:
 SODEPALM GROUP 1969

Source	Amount	
	(Millions of CFA)	(Percent of Total)
Government of the Ivory Coast	7,164	22%
Caisse Autonome d'Amortissement	1,203	4
National Agricultural Development Bank	1,952	6
Total Ivory Coast	10,319	32
European Development Fund	9,965	31
World Bank	6,293	20
Caisse Centrale de Coopération Econcmique	2,762	9
European Investment Bank	2,527	8
Fonds d'Aide et de Coopération	119	-
Total International	21,666	68
Grand Total	31,985	100

Source: Adapted from Jean-Francois Talon, "Le Groupe SODEPALM"
 (thesis for diplôme d'études supérieures, Université
 d'Abidjan, October 1972), p. 78.

C. Personnel

SODEPALM, faced with a scarcity of trained Ivorians, tapped the international job market for its top employees. It hired competent expatriates (French) who came directly from overseas to SODEPALM, owing no allegiance to the Ivorian government. They were only slowly replaced by Ivorians. The SODEPALM Group continued this pattern. In 1969, only about twenty percent of the top forty-one managers were Ivorians; in 1973 the fraction of Ivorians in the top echelon had only risen to about thirty percent. One constraint on Ivorianizing certain high level posts was that trained Ivorians preferred working in headquarters: as late as 1973, only one of the ten mill managers was an Ivorian. Middle and bottom management were Ivorianized much more rapidly (see tables 30 and 31). At the bottom of the personnel ladder, eighty percent of the plantation laborers were immigrants from the Sahel.

Management turnover was low, and Ivorians replacing expatriates were almost invariably promoted only after achieving considerable seniority. In 1974, for example, Ivorians replaced five key expatriates, including the chief executive officer. All the incoming Ivorians had spent at least seven years at SODEPALM and the Group. The departing expatriates were all assisted in finding alternative employment. This policy maintained management morale and continuity, avoided the vicissitudes accompanying politically appointed staff, and provided an incentive for Ivorian staff.

In 1971 a wage incentive system was adopted which

TABLE 30

IVORIANIZATION OF MANAGEMENT OF SODEPALM GROUP 1963-1973

	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Directors, Assistant Directors	1 ^a (0) ^b	4 (0)	4 (0)	5 (1)	7 (2)	6 (2)	7 (3)	11 (4)	10 (4)	13 (4)	13 (5)
Department Heads	0 (0)	1 (1)	2 (1)	3 (2)	4 (1)	8 (1)	10 (2)	7 (0)	12 (2)	13 (1)	16 (5)
Engineers	0 (0)	0 (0)	3 (0)	3 (1)	5 (2)	7 (5)	8 (3)	11 (5)	16 (5)	14 (5)	33 (14)
Estate Managers	0 (0)	3 (0)	8 (0)	10 (1)	13 (1)	15 (2)	13 (0)	14 (0)	15 (1)	18 (4)	19 (4)
Oil Mill Managers	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	2 (0)	3 (0)	4 (0)	8 (0)	9 (0)	10 (1)
Staff Assistants	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (2)	2 (2)	2 (2)	3 (3)	4 (4)
Office Chiefs	0 (0)	3 (2)	3 (2)	4 (2)	9 (5)	6 (4)	5 (3)	7 (5)	13 (6)	17 (9)	22 (10)
Heads of Production and Maintenance	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	2 (0)	4 (0)	6 (0)	9 (0)	11 (0)	14 (1)
Regional Directors	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0)	3 (2)	4 (2)	4 (2)
Sector Chiefs	0 (0)	6 (0)	7 (0)	9 (4)	12 (9)	20 (16)	20 (17)	19 (19)	22 (22)	23 (23)	23 (23)
Office Workers	0 (0)	1 (1)	4 (3)	5 (4)	15 (12)	20 (16)	25 (21)	31 (27)	39 (37)	48 (46)	60 (55)
Misc. White Collar	0 (0)	0 (0)	0 (0)	0 (0)	2 (2)	4 (4)	8 (8)	11 (11)	15 (15)	14 (14)	17 (17)
Total White Collar	1 (0)	28 (7)	60 (14)	70 (24)	113 (48)	132 (68)	145 (79)	167 (96)	215 (129)	241 (146)	296 (184)
Percent Ivorian	0%	25%	23%	34%	42%	52%	54%	57%	60%	61%	62%

Source: SODEPALM, "Textes de Presentation des Structures du Groupe" (Abidjan: SODEPALM, March 1973), vol 1, table 14.
Translated and slightly adapted by the author.

^aTotal in category.

^bNumber of Ivorians (in parentheses).

TABLE 31
 IVORIANIZATION OF MANAGEMENT
 AND WHITE COLLAR POSITIONS IN 1972
 BY JOB CATEGORY^a

Parodi Index ^a	Number of Ivorians	Number of Expatriates	Percent Ivorian
500	5	23	18%
400-499	6	34	15%
300-399	29	34	46%
200-299	38	4	90%
0-200	68	0	100%
Total	146	95	61%

Source: The data is from SODEPALM, "Structures du Groupe," p. 12.

^aThe Parodi Index was developed by a former French Minister of Labor and Social Welfare, named Parodi. It serves to evaluate diverse white collar jobs and place them on a single scale used for determining salary levels.

incorporated into employees' wages the productivity of the entire SODEPALM Group, the productivity of their particular administrative unit, and their individual productivity. The total incentive payment amounted to five to ten percent of a staff paycheck. The next year, productivity incentives were paid to farmers who produced greater than expected yields of oil palm fruit. No systematic before-and-after comparisons of performance under productivity incentives are available, but members of SODEPALM said the system had worked well for the farmers until it was abolished.¹ In 1980 it was still functioning for SODEPALM staff.

The author examined several employee salary statements and found a narrow range of productivity coefficients, clustered towards the top end of the scale. This could reflect a uniformly excellent staff. More likely, it indicates a dwindling of the pay increment possible for truly outstanding performance.²

The 1978 reorganization of SODEPALM/Palmindustrie produced an exodus of top SODEPALM officials. The president of the palm parastatal since 1974 left, along with the director of land clearing, the chief technical advisor for the

¹Interviews conducted by the author, May 1980.

²Five extension agents (encadreurs) and two first line extension supervisors (agents de liason) were fired during 1979 (about four percent of the total employees in these categories). Disincentives for poor performance seem effective, at least for the lower personnel levels.

smallholder program, and several managers of industrial estates. Other technical assistants were transferred away from headquarters. Morale at SODEPALM and Palmindustrie was consequently very low.

D. Finance

The SODEPALM Group. When the Ivorian oil palm parastatal attained the status of a fully integrated agro-industrial operation with the creation of the SODEPALM Group in 1969, its total equity was 2.95 billion CFA: Palmindustrie held 2.5 billion, SODEPALM held 400 million, and Palmivoire held 50 million. All of SODEPALM's equity was from the Ivorian government; the equity of Palmivoire and Palmindustrie came from Ivorian parastatals, the Ivorian state, and domestic and international private corporations (see tables 32 and 33).

The SODEPALM Group was a financial success. Over the period 1969-1975, it invested 46.4 billion CFA,¹ which it financed primarily through bank loans (fifty-three percent) and its own accumulated profits and depreciation (thirty-two percent).² During its tenure, the Group fulfilled debt

¹About U.S. \$189 million.

²By the end of fiscal year 1976, the Group's total self-generated investment totalled 17.2 billion CFA: About U.S. \$70 million. This and other figures in the above paragraph are unofficial World Bank estimates.

TABLE 32
 SHAREHOLDERS AND TOTAL
 EQUITY OF PALMINDUSTRIE 1969

Shareholder	Share (millions of CFA)
Government of the Ivory Coast	1,810.0
B.I.C.I.C.I.	14.66
S.G.B.C.I.	27.17
B.I.A.O.	27.17
S.I.B.	17.25
SOGESCOL Ivory Coast	23.67
S.C.B.	127.09
Société des Terres Rouges	25.77
La Forestière Equatoriale	53.47
Franco Africaine de Raffinage	143.73
S.I. Elaeis	0.02
SONAFI	204.95
SOCIPEC	0.05
B.N.D.A.	25.0
Total Equity	2,500.00

Source: Adapted from Talon, "SODEPALM," p. 118

TABLE 33
 SHAREHOLDERS AND TOTAL
 EQUITY OF PALMIVOIRE 1969

Shareholder	Share (thousands of CFA)
Government of the Ivory Coast	20,000
B.I.C.I.C.I.	640
S.G.B.C.I.	1,180
B.I.A.O.	1,180
S.I.B.	750
SOGESCOL Ivory Coast	1,000
S.C.B.	5,530
Société des Terres Rouges	1,120
La Forestière Equatoriale	2,350
Franco Africaine de Raffinage	6,230
S.I. Elaeis	20
SONAFI	9,450
SOCIPEC	50
B.N.D.A.	500
Total Equity	50,000

Source: Adapted from Talon, "SODEPALM," p. 117

service obligations totalling 10.5 billion CFA. Grants, equity, and subsidies provided only fifteen percent of the Group's investment capital. By the end of fiscal year 1976, the Ivorian government had received directly from the Group and indirectly through the Stabilization Fund approximately 18.6 billion CFA in profits, dividends, and taxes.

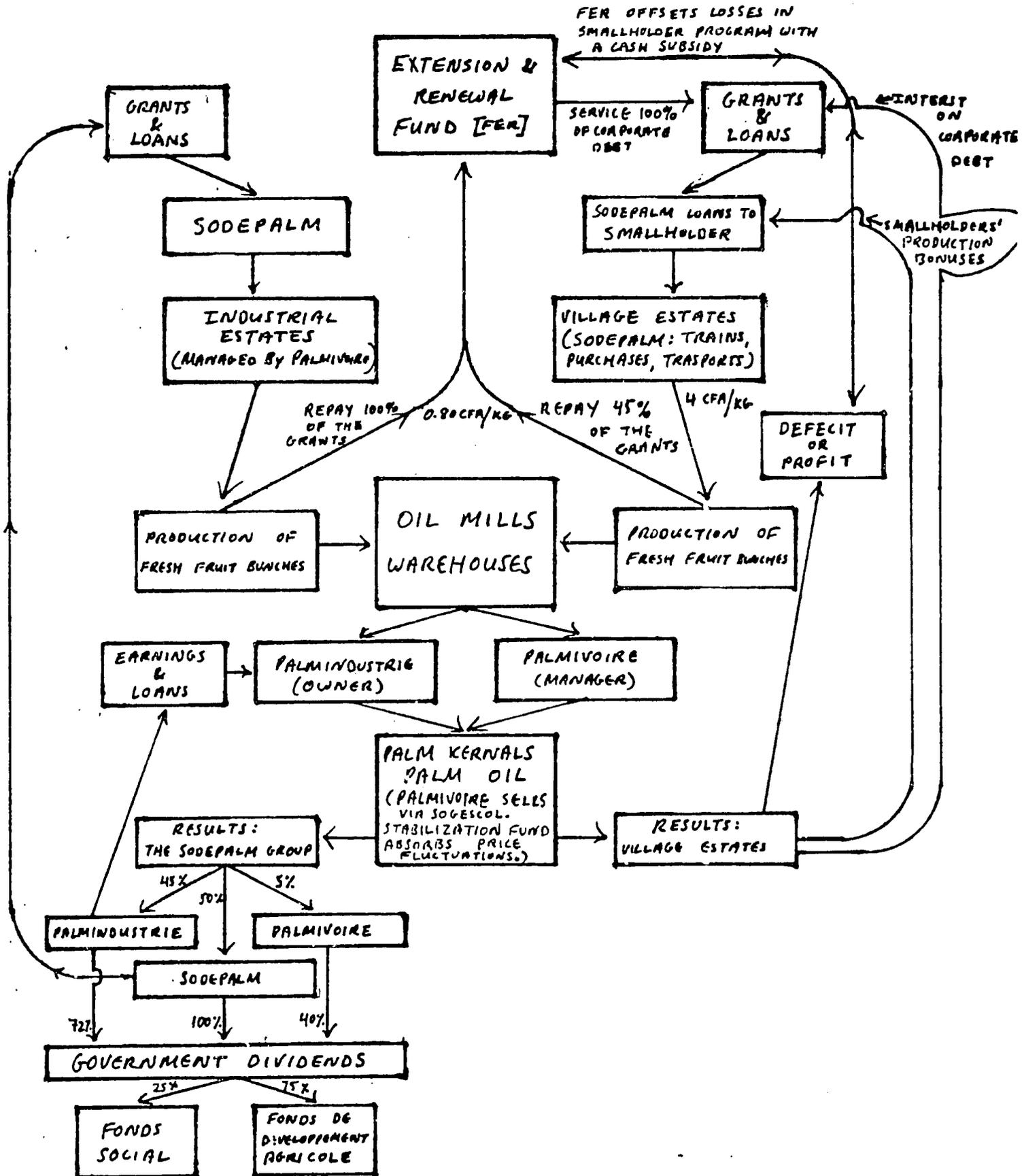
The dual production structure (industrial and village plantations) complicated the Group's flow of cash (see figure 18). The industrial plantations, owned by SODEPALM, were financed by grants and medium/long-term loans. The loans were serviced by SODEPALM's share (fifty percent) of the Group's profits on sales of palm oil and kernels. The oil mills and warehouses were financed by loans as well as by profits and accumulated depreciation. The loans were paid from Palminindustrie's share (forty-five percent) of the Group's profits. The remaining five percent of Group profits reimbursed Palmivoire for managing the industrial estates, mills, warehouses, and sales.

The village plantations were financed by grants and loans channeled through the rural development part of SODEPALM (SODEPALM-Rural-Development). Smallholders paid SODEPALM-Rural-Development thirty-five percent of the cost of establishing their plantations through a levy of 0.8 CFA per kilo of fresh oil palm fruit. The levy went into the Fund for Extension and Renewal.¹ The same 0.8 CFA/kilo levy was exacted on fresh

¹The Fonds d'Extension et de Renouveaulement was created by decree 69-264 of 12 June 1969.

FIGURE 18

CASH FLOW OF THE SODEPALM GROUP



fruit bunches from the industrial estates; it too went into this fund. The Fund for Extension and Renewal paid the interest and principal on the loans for establishing village plantations. SODEPALM-Rural-Development also received a portion of profits from the Group's sale of processed palm products. These funds were used to pay debt service and to pay farmers' production bonuses. Any financial shortfall at the end of the fiscal year was covered by the Fund for Extension and Renewal; any surplus went into the fund.

The SODEPALM Group was run much like a business: it made profits and shareholders earned dividends. The government's dividends went into two funds: the Social Welfare Fund and the Agricultural Development Fund.¹ Throughout the period 1969-1976, seventy-five percent of the government dividends went into the Social Welfare Fund, financing investments to improve the welfare of laborers on the industrial estates. Twenty-five percent of the government's dividends went into the Agricultural Development Fund. This fund financed investment in other crops than oil palm. While the Group exerted significant control over the Social Welfare Fund and the Fund for Extension and

¹The Fonds Social was created by decree 69-153 of 17 April 1969. The Fonds de Développement Agricole was established by decree 69-152 of 17 April 1969.

Renewal, the government had virtually complete discretion over the uses of the Agricultural Development Fund. In 1977, the proportions of government dividends allocated to the two funds were slated to reverse but, before the switchover, the Group was dissolved.

Post SODEPALM Group. After the Group's dissolution, the palm parastatals' finances deteriorated. From fiscal years 1975/1976 to 1977/1978, SODEPALM/Palminindustrie found itself in dire straits. The government had taken over the parastatal's loan portfolio and, while lengthily reviewing the loans, suspended payments of counterpart funds. Under the loan agreements, creditors such as the World Bank would only disburse their loans if the Ivory Coast contributed funds.¹

By 1978, these undisbursed loans totalled 14.5 billion CFA. Although the flow of investment capital virtually ceased, work in many cases had already been completed or was in progress. To pay for finished projects and to ensure that ongoing work was not abandoned, the parastatal had recourse to the only source of credit it could legally tap: domestic banks.

SODEPALM/Palminindustrie ceded the processed palm products

¹This is a common procedure to ensure that the recipient of a concessional loan is truly committed to the project being funded.

to the Stabilization Fund in return for three kinds of revenue, paid out of a special Stabilization Fund account holding the net proceeds of palm product sales. The palm parastatals' annual operating costs and amortization of assets depreciated over less than five years were divided by the projected level of annual palm products output to determine a breakeven price per ton for palm oil, kernals, and coprah. The fraction of the price which covered operating costs was paid within a month after the Stabilization Fund received the finished palm products. The fraction of the price which covered short term depreciation was paid semi-annually to permit SODEPAL/Palminindustrie to service its debt. Funds to cover amortization of major assets depreciated over a longer period than five years were allocated to a special account held by the CAA, which could be tapped only after the board of directors and relevant ministers had agreed to a given capital expenditure project. Any surplus in the Stabilization Fund palm account after these three obligations were met was presumably for additional investment in the palm sector.

The net result of this cumbersome revenue system was to almost completely eliminate the palm parastatals' chief executive officer's discretion regarding the use of funds. Disbursing funds to cover debt servicing separately from funds to cover operating costs prevented the chief executive from having any temporary buffer fund except for domestic bank overdrafts.

Although the negotiated price was intended to permit the palm parastatal to break even, adverse weather reduced production significantly below the forecasts for fiscal year 1975/1976 and again for 1976/1977. The price was not re-negotiable and it was not divided into fixed and variable cost components, so the unanticipated production shortfalls translated into a three billion CFA reduction in operating revenue below the amount anticipated. To compensate for the shortfalls in both investment and operating revenues, in two years the parastatal ran up a domestic bank overdraft at high interest rates that reached almost 19 billion CFA, or about 80 million dollars (see table 34).

TABLE 34

DOMESTIC BANK OVERDRAFT OF
THE PALM PARASTATALS 1973-1978

Date	Amount of Overdraft (billions of current CFA)
30 Dec. 1973	0.7
31 Dec. 1974	0
30 Sept. 1975	0
30 Sept. 1976	6.3
30 Sept. 1977	13.9
14 August 1978	18.8

Source: Palminindustrie

An equally striking indicator of the palm parastatals' financial debacle is the deterioration of working capital from 3 billion CFA in 1974 to -16.4 billion CFA only five years later (see table 35).

TABLE 35
WORKING CAPITAL OF
THE PALM PARASTATAL 1973-1979

Fiscal Year	Parastatal(s)	Working Capital (billions of current CFA)
1973	SODEPALM Group	0.9
1974	SODEPALM Group	3.0
1974/1975	SODEPALM Group	2.0
1975/1976	Transition to SODEPALM/ Palminindustrie	- 3.1
1976/1977	SODEPALM/Palminindustrie	-11.7
1977/1978	Transition to Palminindustrie	-14.4
1978/1979	Palminindustrie	-16.4

Source: SODEPALM Group, SODEPALM/Palminindustrie, and Palminindustrie financial reports.

In fiscal year 1977/1978, the government initiated a series of measure intended to rectify the palm parastatals' catastrophic financial situation. The Stabilization Fund divided the price it paid SODEPALM/Palminindustrie for palm products into fixed and variable costs, thereby ensuring that future unanticipated production shortfalls would not create financial crises. In 1978, the government resumed payment of loans' counterpart funds, clearing the way for international

creditors to disburse long-delayed financing.

In spite of all these actions, the palm parastatals remain a long way from financial health. The Ministry of Agriculture slashed SODEPALM's fiscal year 1979/1980 budget from a proposed five billion CFA to three billion CFA. No funds at all had been released as of May 1980--after eight months of the fiscal year had already elapsed! In part, the fault is SODEPALM's: it has failed to properly submit vouchers for legitimate expenditures that the Ministry of Agriculture will reimburse. During these eight months, SODEPALM scraped by on the Stabilization Fund's monthly payment for processed palm products.

The Effects of Financial Vicissitudes. In fiscal year 1977/1978, blocked international loans and lack of government funds precluded developing plant material for seedlings. In fiscal year 1978/1979, smallholders planted no new oil palm for the first time since 1963. Funds were allocated in fiscal year 1978/1979 to develop plant material for seedlings the following year. A large program, including roughly 800 thousand coconut seedlings was planned. In fiscal year 1979/1980, after IRHO had developed the plant material, SODEPALM had established a new large coconut palm nursery, and IRHO had shipped the first consignment of roughly sixty thousand fertilized coconuts, the Ministry of Agriculture abruptly cancelled the program. IRHO managed to export most of its

remaining plant material, but the mistrust the Ministry's actions engendered will linger at IRHO and among small-holders who awaited coconut seedlings that never arrived.

The oil palm program proceeded more smoothly than the coconut program until the spring of 1980, when the Ministry of Agriculture abruptly informed SODEPALM that: (1) money for oil palm nurseries had run out and the seedlings would have to be distributed early, and (2) there was no cash for crucial complementary inputs - fertilizer, cover crop, and grillwork to protect the seedlings from rodents. Instead of the former policy of controlling cultivation techniques by requiring peasants to accept these key inputs at a subsidized cost, and ensuring that farmers utilized them properly, the Ministry ordered SODEPALM to hand out the seedlings free and let the farmers tend them as best they could. Agricultural experts predict sharply lower yields when the improperly tended seedlings mature. SODEPALM was trying to get the National Agricultural Development Bank (BNDA) to provide SODEPALM with funds which it would re-loan to farmers so they could purchase some of the inputs. By May 1980, the BNDA still showed no interest in the scheme.¹

¹The director of the BNDA himself had an unhappy experience with oil palm. He had a palm plantation established with SODEPALM's assistance; its production had never merited a productivity bonus.

The Ministry of Agriculture now stresses raising current production. New harvest techniques utilizing long bamboo poles imported from Malaysia have been introduced with great fanfare. They will permit the economical harvesting of aging palms that grew too tall for conventional harvest methods. Investments with a long term return were avoided in fiscal year 1979/1980. Fertilizer was applied nowhere but the industrial estate at Dabou where the soil is poor. No investments in replanting the palm estates were undertaken. Prices for fresh fruit bunches and coconuts were maintained at low levels, discouraging smallholders from commencing palm cultivation or expanding their existing palm plantations. Palmindustrie received no allocation to purchase new vehicles for collecting peasants' oil palm, which will mean gradual deterioration of the collection services. Unless these policies are quickly reversed, it seems probable that the palm sector will fall into a vicious cycle of decreasing efficiency, leading to financial losses, which in turn will preclude investments needed to return the sector to efficient production of palm products.

E. Evaluation

The oil palm parastatals achieved the fundamental objective of diversifying the Ivory Coast's agricultural exports. Oil palm's favorable domestic resource cost is reflected in the SODEPALM Group's profits over the period 1963-1976. IRHO

calculated that in 1977/1978, the cost of cultivating oil palm in the Ivory Coast fell mid-way between two other major producers.¹ Assuming that Ivorian oil mills operated at full capacity, the potential profit margin (including depreciation) on sales of palm oil in 1979 was eight-five percent: approximately U.S. \$296 profit per ton of oil (see table 36).

During 1978/1979, the Ivorian palm sector made profits far below the eighty-five percent margin possible. The chief cause of its lackluster performance was the extremely low harvest of fresh fruit bunches. Weather, parasites, low producer prices, and palms too tall to harvest all contributed to the shortfall. The net result was that Ivorian mills, which had been operating increasingly below capacity, reached a new low: roughly one-half of full capacity. Despite a reduction in cultivation expenses, the extremely high unit cost of milling drove up the total production cost per ton of palm oil in the Ivory Coast to about double the level of its chief competitors.² The difficulties of the coconut sector

¹See: the Institut de Recherches des Huiles et Oléagineux, "Diagnostic des Moyens de Production de Palmindustrie; Rapport de Mission; Palmier à Huile" (Abidjan, IRHO, December 1978 - January 1979), p. 197. IRHO calculated that the agricultural costs per hectare of oil palm were: 37,328 CFA in Malaysia; 27,786 CFA per hectare in the Ivory Coast; and 17,140 CFA in Indonesia.

²See: Ibid. Most of the savings on the cost of cultivating oil palm were achieved at the expense of future production: reductions in new planting and application of fertilizer. Milling costs were exacerbated by the high cost of spare parts and by Palmindustrie's high interest debt.

TABLE 36
 COSTS AND PROFITS OF PALM OIL AND
 COPRAH OIL IN 1979 ASSUMING OIL
 MILLS OPERATE AT FULL CAPACITY. (In CFA)

	<u>Palm Oil</u>	<u>Coprah Oil</u>
Agricultural costs	26,330	31,225
Agricultural depreciation	9,470	8,986
Production of coprah (including depreciation)	-	31,471
Costs of processing (including depreciation)	27,980	20,167
Transportation, warehousing	3,950	6,946
Administrative cost	6,630	3,189
Total cost	74,360	106,984
Market price per ton CIF ^a	137,385	206,610
Profit per ton ^b	63,025	99,626
Profit margin ^c	85%	93%

Source: Institut de Recherches des Huiles et Oléagineux,
 "Diagnostic des Moyens de Production de Palminindustrie"
 (Abidjan: IRHO, December 1978/January 1979), p. iv.

^aPrice in January 1979.

^bProfits in U.S. dollars were: \$296/ton of palm oil, and
 \$468/ton coprah oil.

^cProfit margin is calculated as: $\frac{\text{price}-\text{cost}}{\text{cost}}$

parallel those of oil palm. Table 37, which compares coprah oil production in the Phillipines and in the Ivory Coast gives a good indication of oil palm's problems: high Ivorian milling costs account for the bulk of the cost differential between the two countries.

The village oil palm program has channeled considerable sums into the Southern forest zone and littoral, but the intended targets of the program, local Ivorian smallholders, benefited from the program less than higher and lower socio-economic groups did. Gross revenue from oil palm cultivation per farmer, per hectare, and per man-day have all stagnated or declined since 1974. Disenchanted farmers are now adopting alternatives to the official palm program.

Since 1976, when the government took control of SODEPALM's finances, the organization has been unable to develop a coherent long term program of action. The abrupt elimination of funds and the ensuing debacle of the oil palm and coconut seedling program during 1979/1980 was only the most recent of a series of shocks. Splitting the agro-industrial complex of mill/industrial estate/village plantations into two administrative units is likely to create more inefficiencies than it has resolved. Lack of new planting on village and industrial estates and deterioration of the fleet of vehicles that collect village estates' fruit bunches has laid the foundation for a crisis in the late 1980s.

TABLE 37
 COMPARISON OF COCONUT PRODUCTION COSTS
 PER HECTARE IN 1978: IVORY COAST
 VERSUS PHILIPPINES (CFA francs)

	<u>Philippines.</u>	<u>Ivory Coast</u>
Cultivation cost	2,610	7,947
Fertilizer ^a	11,832	34,108
Harvest cost	5,075	8,840
Road maintenance	3,335	1,480
Processing ^b	3,190	77,999
Transportation	2,233	-
General and administrative costs	42,270	44,155
Total per hectare	75,545	174,529
Cost per ton	29,056	45,772

Source: Institut des Recherches des Huiles et Oléagineux,
 "Diagnostic des Moyens de Production de PALMINDUSTRIE"
 (Abidjan: IRHO, December 1978/January 1979), pp. 72-
 73, table XXX.

^aLess fertilizer is applied in the Philippines than in
 the Ivory Coast.

^bThe difference between processing costs in the Philippines
 and the Ivory Coast reflect lower Filipino wages, and the fact
 that the Filipino cost excludes depreciation of the oil mills.
 Estimating depreciation of Philippine mills at a generous
 30,000 CFA per ton still means that Ivorian cost per ton is
 sixty-five percent higher than the cost of processing in the
 Philippines.

In sum, although the Ivorian palm program did not significantly raise the welfare of its target population, it channeled revenue into rural areas, made profits for the nation as a whole, generated foreign exchange, facilitated the establishment and expansion of a palm oil agro-industry, and diversified agricultural exports. In recent years, these benefits have drastically dwindled, and the prospects are for further deterioration.

XII. PARASTATALS IN THE COFFEE AND COCOA

SECTORS: SATMACI AS AN ORGANIZATION

A. History of the Coffee and Cocoa Sectors

Coffee and cocoa reached the Ivory Coast during the nineteenth century, but the crops were not widely adopted until after 1910 (cocoa) and during the late 1920s (coffee). Unlike previous Ivorian agricultural exports, which were gathered from natural stands growing wild in the forest, coffee and cocoa were unfamiliar crops that had to be cultivated. Farmers mistrusted the novel plants and the novel activity of raising a crop for purely commercial purposes.

The colonial administration's solution to Ivorian recalcitrance was to intervene in commercial agriculture both indirectly (producer price incentives) and directly (coercion, cultivation guidelines, distribution of improved plant stock). Cocoa was the initial focus of colonial agricultural policy: world prices were high, and the administration felt it was a simpler crop to cultivate than coffee. Governor Angoulvant (1908-1916) embarked upon a campaign to coerce farmers in the Southeastern forest zone into growing cocoa. Lauer (1973:89, 131), however, argues that Angoulvant's program of coercion played a smaller role in the widespread adoption of cocoa than attractive producer prices and diffusion of enthusiasm

and techniques for cultivating cocoa from Agni cocoa farmers in Ghana to their fellow tribesmen in the Ivory Coast. Moreover, during the post 1910 period, two major sources of revenue disappeared for Ivorians in the forest zone: Europeans were taking over the lumber trade, and a surge of rubber exports from new Southeast Asian plantations depressed world rubber prices from 1913 onwards.

Cocoa exports expanded tremendously. From eight tons in 1910 they rose to 1036 tons in 1920, 22,239 tons in 1930, and 55,000 tons in 1939.¹ However, the doubling of production from 1930 to 1939 resulted from maturing cocoa trees entering into production, not from expanding hectareage. With the onset of the Depression, cocoa prices had fallen (see table 38) and new planting virtually ceased until after World War II.

Coffee, by contrast, was neglected by Angoulvant's administration on the grounds that it was too difficult for Africans to cultivate. Not until the early 1920s did the colonial administration decide that peasants who could successfully cultivate cocoa could also grow coffee. The major impetus to coffee cultivation in the Ivory Coast resulted from the effect of the Great Depression on France: unwilling to rely upon uncertain world trade, the French government committed itself to a policy of autarky. The Overseas Empire already produced enough cocoa to satisfy the needs of metropolitan

¹For cocoa and coffee export statistics over the period 1900-1960, see table 1.

France, but the metropole depended on Brazil for its coffee. To eliminate this dependence, France began heavily promoting coffee.

Inspired by the apparent success of Angoulvant's coercive cocoa strategy, the Ivorian administration commenced a massive program of free coffee seedling distribution and compulsory cultivation. Between 1931 and 1934, the administration distributed twenty-two million coffee seedlings. Coffee hectarage more than doubled: from fourteen thousand hectares in 1931, it rose to thirty-six thousand hectares in 1934. By 1935, the trees planted in the late 1920s were beginning to produce. Exports climbed from a miniscule 445 tons in 1930 to 5183 tons in 1935. A decade later, the Ivory Coast exported 37,872 tons of coffee--considerably higher tonnage and value than exports of cocoa that year. Coffee prices remained significantly higher than cocoa prices until the 1950s (see tables 38 and 39) and coffee hectarage continued to augment rapidly. Since the 1940s, coffee has been the Ivory Coast's single most valuable export.

Cocoa hectarage, which stagnated during the 1930s and 1940s, expanded in the 1950s, stimulated by high producer prices. World coffee prices declined during the late 1950s, prompting the colonial administration to abolish the planting cash bonus for coffee, while retaining the bonus for cocoa. At peak production, a ton of cocoa demands only about two-thirds the labor required to obtain a ton of coffee. When the

TABLE 38
 COMPARISON OF OFFICIAL
 CUSTOMS VALUES FOR IVORIAN
 EXPORTS OF COFFEE AND COCOA 1920-1939 AND 1951-1959
 (per kilogram)

Year	Coffee (current francs)	Cocoa	
		(percent of coffee price)	(more, less or equal to 67% of coffee price)
1920	5.0	43%	-
1921	3.5	71	+
1922	3.75	63	-
1923	3.5	66	-
1924	4.0	57	-
1925	5.0	48	-
1926	8.25	51	-
1927	9.0	67	0
1928	9.5	78	+
1929	9.0	67	0
1930	8.5	53	-
1931	5.25	62	-
1932	4.75	56	-
1933	5.0	40	-
1934	5.0	28	-
1935	5.0	26	-
1936	5.0	29	-
1937	5.0	65	-
1938	5.5	57	-
1939	5.5	51	-
1941 ^a	6	25	-
1951/2	150	70	+
1952/3	150	70	+
1953/4	155	68	+
1954/5	140	96	+
1955/6	120	92	+
1956/7	120	79	+
1957/8	120	79	+
1958/9	125	88	+

^aThe 1941 prices are those offered producers in the Western Ivory Coast, and are not comparable to the other, official customs prices.

Source: Lauer, "Economic Innovations," pp. 215-216.

TABLE 39
 PRE-INDEPENDENCE
 COFFEE PRICES AT ABIDJAN
 1926-1938 AND 1945-1960
 (francs per kilogram)

Year	Current Francs	1938 Francs	Index for Prices of Selected Imports ^a 1938 = 100
1926	12.3	9.60	128
1927	12.9	10.10	128
1928	7.5	6.05	124
1929	9.25	8.40	110
1930	4.55	4.33	105
1931	4.00	4.90	82
1932	4.95	7.30	68
1933	5.00	8.30	60
1934	5.00	9.60	52
1935	4.50	8.50	53
1936	4.20	7.80	54
1937	4.75	5.30	89
1938	5.25	5.25	100
1945/46 ^b	15.13	3.08	491
1946/47	22.53	3.65	616
1947/48	37.92	3.04	1247
1948/49	52	3.25	1599
1949/50	91	5.60	1629
1950/51	137	7.70	1776
1951/52	123	6.20	1979
1952/53	137	8.10	1690
1953/54	164	10.60	1550
1954/55	103	6.80	1517
1955/56	95	n.a.	n.a.
1956/57	111	n.a.	n.a.
1957/58	156	n.a.	n.a.
1958/59	126	n.a.	n.a.
1959/60	105	n.a.	n.a.

^aThe price index is taken from Joseph J. Lauer, "Economic Innovations Among the Doo of Western Ivory Coast 1900-1960" (Ph.D. dissertation, University of Wisconsin, 1973), appendix C. It is based on a basket of imported goods consumed by West Africans during 1950-1951.

^bThe trade year ran from 1 October to 30 September. Current prices are deflated by the price index for the calendar year in which the trade year ends.

Source: Lauer. "Economic Innovations." p. 213.

producer price for cocoa exceeds two-thirds of the price for coffee, returns per man-day for cocoa surpass returns for coffee. Since the late 1950s, cocoa prices have remained above this threshold (see table 40), and cocoa hectarage has increased more rapidly than coffee hectarage. The Ivory Coast currently has about 0.9 million hectares planted in cocoa, and 1.3 million hectares planted in coffee.

Estimated cocoa production for the 1978/1979 crop year of 305 thousand tons represents an excellent harvest (see table 41), making the Ivory Coast Africa's largest cocoa exporter for the second consecutive year. However, the nation has recently faced problems maintaining export quality: one-quarter of the 1979 crop failed to satisfy export standards, largely due to harvesting of unripe pods, utilization of improper fermentation techniques, and inadequate drying (see pp. 269,271). Most of the land best suited for cocoa is already in production, so future export expansion must come from improved processing and higher yield per hectare. .

Cocoa yields in the Ivory Coast are low by world standards. Although they exceed those of Nigeria and Ghana, they lie well beneath yields obtained in Central America and Malaysia. Between 1949/50 and 1976/77, Ivorian cocoa yields rose an average of 1.8% per annum.¹

¹This is the percentage increase of a trend estimated by the linear regression model: $\text{Log Yield} = a + b \text{time}$. See Lee, "Export-Led Rural Development," pp. 4-5.

TABLE 40

POST INDEPENDENCE OFFICIAL
PRODUCER PRICES FOR COFFEE AND
COCOA 1960-1978 (per kilogram)

Year	Coffee (current francs)	Cocoa (current francs)	Cocoa (percent of coffee price)	
1958/59	108	84	78%	
1959/60	98	85-89	87%	91%
1960/61	n.a.	89		n.a.
1961/62	73	64		88
1961/63	73	64		88
1963/64	80-90	70	88	78
1964/65	90	70		78
1965/66	75	55		73
1966/67	90	70		78
1967/68	90	70		78
1968/69	90	70		78
1969/70	95	80		84
1970/71	105	85		81
1971/72	105	85		81
1972/73	105	85		81
1973/74	120	110		92
1974/75	150	175		117
1975/76	150	175		117
1976/77	180	180		100
1977/78	250	250		100

Source: République de Côte d'Ivoire, Ministère de l'Agriculture, Direction des Statistiques Rurales et des Enquêtes Agricoles, "Statistiques Agricoles; Memento 1947-1977" (Abidjan, Imprimerie SATMACI, February 1979), p. 17.

TABLE 41
COFFEE HECTARAGE AND
PRODUCTION 1949-1979

Year	Total Hectarage (thousands of hectares)		Total Production (thousands of tons)
	Planted	Harvested	
1949/50	n.a.	179	64
1950/51	n.a.	206	59
1951/52	n.a.	185	64
1952/53	n.a.	248	51
1953/54	n.a.	285	82
1954/55	n.a.	304	92
1955/56	n.a.	383	114
1956/57	n.a.	394	108
1957/58	n.a.	469	104
1958/59	n.a.	539	153
1959/60	n.a.	345	134
1960/61	n.a.	396	186
1961/62	n.a.	460	97
1962/63	n.a.	516	195
1963/64	n.a.	560	261
1964/65	n.a.	587	202
1965/66	n.a.	615	273
1966/67	n.a.	632	131
1967/68	n.a.	649	288
1968/69	736	665	210
1969/70	868	652	280
1970/71	887	674	240
1971/72	910	695	269
1972/73	953	741	302
1973/74	1060	847	196
1974/75	1176	863	270
1975/76	1214	901	308
1976/77	1254	921	291
1977/78	1292	951	195
1978/79	n.a.	n.a.	290 ^a

^aEstimate

Source: Ministry of Agriculture

Coffee production in 1978/79 of roughly 290 thousand tons was very good, especially compared to the previous harvest which was the lowest in over a decade (see table 42). Production has stagnated since the mid 1960s. Like cocoa, coffee planting is reaching the limits of land best suited for cultivation. Moreover, the Ivorian coffee orchard is elderly: in 1976 thirty-nine percent of Ivorian coffee hectareage has been planted before independence in 1960. However, yield per hectare increased an average of only 0.8% per annum over the period 1949/50 to 1976/77, and fluctuated sharply (see table 44).¹ The tremendous expansion of coffee and cocoa exports resulted mainly from spreading hectareage, and only marginally from increasing yield.

B. World Markets

Coffee. World demand for coffee is relatively price inelastic: changes in supply create important price fluctuations. World harvests in 1973/74 and 1974/75 were very good (see table 45) and the resulting oversupply depressed prices to their lowest level in constant terms for the entire 1955 to 1978 period (see table 46). The 1975/76 harvest was well below average due to a disastrous frost in Brazil. Not until 1977/78 did the Brazilian harvest return to a level approaching normal. During this time (1976 to 1978) coffee prices rose

¹See *ibid.* Coffee yields fluctuated greatly around the trend ($R^2=.06$).

TABLE 42
COCOA HECTARAGE AND
PRODUCTION 1949-1979

<u>Year</u>	<u>Total Hectarage</u> (thousands of hectares)		<u>Total Production</u> (thousands of tons)
	<u>Planted</u>	<u>Harvested</u>	
1949/50	n.a.	158	60
1950/51	n.a.	177	62
1951/52	n.a.	173	44
1952/53	n.a.	181	61
1953/54	n.a.	172	59
1954/55	n.a.	188	75
1955/56	n.a.	226	71
1956/57	n.a.	211	73
1957/58	n.a.	213	45
1958/59	n.a.	237	52
1959/60	n.a.	238	62
1960/61	373	261	94
1961/62	388	268	81
1961/63	401	277	103
1963/64	417	292	98
1964/65	434	308	148
1965/66	453	327	113
1966/67	473	343	150
1967/68	494	358	147
1968/69	517	371	144
1969/70	539	387	181
1970/71	562	404	179
1971/72	586	423	226
1972/73	611	441	185
1973/74	791	450	209
1974/75	815	471	241
1975/76	840	498	227
1976/77	863	526	228
1977/78	896	557	297
1978/79	n.a.	585	305 ^a

^a Source: United States Department of Agriculture, "Agricultural Situation."

Source: Ministry of Agriculture

TABLE 43

COCOA YIELDS PER HECTARE HARVESTED 1960-1979

Year	Annual Yields		Three Year Moving Average	
	(kilograms per hectare)	(indexed 1960/61=100)	(kilograms per hectare)	(indexed 1960/61=100)
1960/61	358	100	307	100
1961/62	303	85	344	112
1962/63	372	104	337	110
1963/64	337	94	396	129
1964/65	479	134	387	126
1965/66	346	97	421	137
1966/67	437	122	398	130
1967/68	410	115	412	134
1968/69	389	109	422	137
1969/70	467	130	433	141
1970/71	443	124	481	157
1971/72	534	149	466	152
1972/73	421	118	458	149
1973/74	420	117	451	147
1974/75	512	143	453	148
1975/76	457	128	468	152
1976/77	434	121	475	155
1977/78	534	149	504	164
1978/79	544 ^a	152	-	-

^aFrom Mandel, "Rendement de Cacao," p. 104. Mandel estimates 1978/79 production as 300,000 tons and 1978/79 harvested area as 584,250 hectares.

Source: Data from the Ministry of Agriculture

TABLE 44

COFFEE YIELDS PER HECTARE HARVESTED 1960-1978

Year	Annual Yields		Three Year Moving Average	
	(kilograms per hectare)	(indexed 1960/61=100)	(kilograms per hectare)	(indexed 1960/61=100)
1960/61	470	100	356	100
1961/62	211	45	353	99
1962/63	378	80	352	99
1963/64	466	99	396	111
1964/65	344	73	418	117
1965/66	444	94	332	93
1966/67	207	44	365	103
1967/68	444	94	322	90
1968/69	316	67	396	111
1969/70	429	91	367	103
1970/71	356	76	391	110
1971/72	387	82	384	108
1972/73	408	87	342	96
1973/74	231	49	317	89
1974/75	313	67	295	83
1975/76	342	73	324	91
1976/77	316	67	288	81
1977/78	205	44	-	-

Source: Ministry of Agriculture

TABLE 45

EXPORTABLE PRODUCTION
1973/74 TO 1979/80

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(000 bags)

Crop year commencing	1 October:		1973	1974	1975	1976	1977	1978	1979
	1 April and 1 July:		1974	1975	1976	1977	1978	1979	1980
			(1)	(2)	(3)	(4)	(5)	(6)	(7)
TOTAL			<u>57,904</u>	<u>57,429</u>	<u>38,951</u>	<u>51,290</u>	<u>56,341</u>	<u>63,205</u>	<u>61,162</u>
	1 October:	1973	1974	1975	1976	1977	1978	1979	
1 October		<u>27,931</u>	<u>12,610</u>	<u>29,443</u>	<u>32,124</u>	<u>31,684</u>	<u>36,806</u>	<u>35,357</u>	
Benin	(R)	22	48	18	16	2	2	4	
Cameroon	(R)	1,527	1,794	1,455	1,281	1,344	1,599	1,733	
Central African Rep.	(R)	121	182	140	155	153	88	183	
Colombia	(A)	5,814	6,702	7,335	8,134	9,643	11,062	10,350	1/
Costa Rica	(A)	1,381	1,277	1,104	1,156	1,303	1,566	1,325	
El Salvador	(A)	2,199	4,349	1,614	2,445	2,675	3,228	2,350	
Ethiopia	(A)	1,008	1,251	1,278	1,349	1,335	1,467	1,480	
Ghana	(R)	48	63	41	55	22	3	34	
Guatemala	(A)	2,084	2,099	1,761	2,170	2,263	2,501	2,039	
Guinea	(R)	15	55	17	35	10	54	60	2/
Honduras	(A)	591	882	543	576	931	1,024	1,200	
India	(A)	770	961	760	1,004	1,295	1,006	1,167	
Ivory Coast	(R)	3,187	3,638	5,107	4,782	3,087	4,677	4,317	
Jamaica	(A)	16	17	22	15	14	14	17	
Kenya	(A)	1,224	1,151	1,204	1,679	1,313	1,193	1,250	
Liberia	(R)	62	75	62	156	146	156	138	
Mexico	(A)	1,890	2,380	2,514	1,734	2,019	2,966	2,500	
Nicaragua	(A)	605	650	714	774	881	874	923	
Nigeria	(R)	26	2	109	31	37	29	65	2/
Panama	(A)	45	19	3	13	60	35	44	
Sierra Leone	(R)	53	106	52	144	100	221	229	
Togo	(R)	237	114	150	176	81	104	167	
Trinidad and Tobago	(R)	18	56	38	44	29	37	38	
Uganda	(R)	3,241	3,302	2,215	2,614	1,636	1,701	2,167	
Venezuela	(A)	373	388	222	189	271	170	227	
Zaire	(R)	1,374	1,049	965	1,399	834	1,029	1,353	2/
	1 April and 1 July:	1974	1975	1976	1977	1978	1979	1980	
1 April		<u>28,209</u>	<u>22,823</u>	<u>7,946</u>	<u>17,239</u>	<u>23,091</u>	<u>24,510</u>	<u>23,993</u>	
Angola	(R)	2,714	1,000	1,040	1,171	533	400	400	
Bolivia	(A)	57	81	73	116	56	129	135	
Brazil	(A)	19,688	15,649	2	9,012	13,860	15,000	14,400	
Burundi	(A)	476	276	356	282	384	467	397	2/
Ecuador	(A)	794	1,040	1,554	1,043	1,623	1,275	1,200	
Indonesia	(R)	1,652	2,033	2,029	2,703	3,954	3,998	3,975	
Madagascar	(R)	1,059	1,001	851	1,152	569	967	1,200	
Malawi	(A)	3	2	2	2	3	6	4	2/
Papua New Guinea	(A)	540	576	797	649	810	813	848	
Paraguay	(A)	106	114	14	45	117	140	150	2/
Peru	(A)	625	617	699	704	873	883	950	2/
Rwanda	(A)	495	432	529	360	309	432	334	
1 July		<u>1,764</u>	<u>1,996</u>	<u>1,562</u>	<u>1,927</u>	<u>1,566</u>	<u>1,889</u>	<u>1,812</u>	
Congo	(R)	10	27	32	45	106	70	70	
Dominican Republic	(A)	483	685	474	762	414	494	350	2/
Gabon	(R)	2	0	6	2	4	6	7	
Haiti	(A)	360	350	270	304	206	425	450	
Tanzania	(A)	909	934	780	814	836	894	935	
Members entitled to a basic quota		55,359	55,020	36,795	49,107	54,231	60,617	58,409	
Members exempt from a basic quota		2,545	2,409	2,156	2,183	2,110	2,588	2,753	
BRAZIL		19,688	15,649	2	9,012	13,860	15,000	14,400	
COLOMBIA		5,814	6,702	7,335	8,134	9,643	11,062	10,350	
OTHER ARABICAS		17,034	20,533	17,287	18,185	19,991	22,002	20,272	
ROBUSTAS		15,368	14,545	14,327	15,959	12,847	15,141	16,140	

Note: For crop years 1973/74 to 1977/78 and for crop year commencing 1 October 1978 data are derived from the figures for opening and closing stocks, exports and domestic consumption unless otherwise indicated. For the crop years commencing 1 April 1979 and subsequently data are those declared by the Member unless otherwise indicated.

1/ USDA estimate (FCOP 1-80)

2/ Estimated

(A) = Arabicas (R) = Robustas

1 bag = 60 kilograms

BEST AVAILABLE DOCUMENT

Source:

TABLE 46
 COFFEE PRICES IN CURRENT AND
 CONSTANT U.S. CENTS 1955-1978^a

Year	Current		1977 Constant	
	¢/kg	¢/lb	¢/kg	¢/lb
1955	133	60.3	385	174.8
1956	151	68.5	422	191.3
1957	139	62.9	374	170.0
1958	110	49.8	296	134.2
1959	94	42.6	252	114.5
1960	91	41.3	240	108.7
1961	83	37.6	215	97.9
1962	79	35.8	208	94.5
1963	78	35.4	205	92.9
1964	104	47.2	269	122.0
1965	100	45.5	251	114.0
1966	93	42.2	231	104.7
1967	86	39.2	211	95.8
1968	87	39.4	226	102.6
1969	88	40.1	228	103.6
1970	114	51.9	265	120.4
1971	100	45.4	215	97.4
1972	110	50.0	214	96.9
1973	137	62.0	220	99.7
1974	146	66.2	188	85.1
1975	144	65.3	161	72.8
1976	316	143.2	346	157.0
1977	531	240.8	531	240.8
1978	366	165.9	318	144.0

^aGuatemalan Prime Washed, Spot New York.

Source: World Bank (May 1979).

dramatically, reaching in 1977 the highest level for the period 1955 to 1979. Since then, prices in constant dollars have very gradually declined. This trend is forecast to continue over the next decade.¹

The bulk of Ivorian coffee is Robusta. The name reflects the preoccupation of colonial agricultural research with hardiness, to the exclusion of productivity or flavor. Robusta has, in fact, a mediocre flavor and commands a lower price than either Arabica or Milds (see table 47). A new hybrid combining the flavor of Arabica with the robustness of Robusta (christened, appropriately: "Arabusta") gives the Ivory Coast the opportunity to enter the premium sector of the world coffee market. Ivorian coffee exports are constrained by quota agreements, but adopting a high value coffee will compensate for the reduced rate at which volume can expand.

Cocoa. Industrial demand for cocoa is price elastic in the medium term, since food processors can substitute less expensive flavors and oils for high priced cocoa. Once the substitution is accomplished it is likely to endure, in spite of subsequent reductions in prices. In the major markets of Europe and North America, low rates of population growth and economic expansion mean that consumer demand for cocoa products has grown slowly in recent years.

¹World Bank unofficial commodity price projections.

TABLE 47
 PRICES OF DIFFERENT VARIETIES OF COFFEE,
 SPOT, NEW YORK, 1955-1979
 (U.S. cents per pound)

Year	Guatemalan Prime Washed	Colombian MAMS	Brazilian Santos 4	Robustas ^a
1955	60.3	64.6	57.1	45.2
1956	68.5	74.0	58.1	38.4
1957	62.9	63.9	56.9	40.2
1958	49.8	52.3	48.4	40.2
1959	42.6	45.2	37.0	30.6
1960	41.3	44.9	36.6	25.3
1961	37.6	43.6	36.0	19.9
1962	35.8	40.8	34.0	21.6
1963	35.4	39.6	34.1	28.7
1964	47.2	48.8	46.7	36.4
1965	45.5	48.5	44.7	31.6
1966	42.2	47.4	40.8	34.0
1967	39.2	41.9	37.8	33.5
1968	39.4	42.6	37.4	33.9
1969	40.1	45.0	40.8	33.1
1970	51.9	56.4	54.6	41.4
1971	45.4	49.3	44.8	42.3
1972	50.0	56.7	51.0	45.2
1973	62.0	27.7	66.9	49.9
1974	66.2	77.9	68.1	58.7
1975	65.3	81.7		61.0
1976	143.2	157.8		127.6
1977	240.8	244.3		233.8
1978	165.9	184.1		147.5
1979	173.5	183.4		165.5

^aThrough 1966: Angola Ambriz 2AA. From 1967 onwards: arithmetic average of Angola Ambriz 2AA, Ivory Coast Superior, and Uganda Native Standard.

Source: World Bank; International Coffee Organization (1979 data only). The World Bank's data is from the International Coffee Organization (Robustas) and the Journal of Commerce (all other types).

The 1977 world cocoa harvest was meagre, especially in West Africa, pushing prices to their highest level in the entire period from 1955 to 1978 (see table 48). However, estimated cocoa production growth rates from 1977 to 1980 for Brazil, the Ivory Coast, Cameroon, and Nigeria cluster around ten percent per annum (see table 49), which significantly outstripped growth in demand.¹ Once supply exceeded demand, cocoa prices collapsed, declining in real terms by more than forty percent between February 1978 and December 1979. Although these prices remain higher in real terms than the lows of the 1960s, the Ivory Coast and other West African cocoa producers find them unacceptable, and have taken steps to form a more effective cartel.²

Long term expansion in cocoa production is estimated at 3.1% per annum (see table 49): roughly in line with forecast expansion in demand. Based on the projections in tables 48 and 49, and on the only partial success of past cocoa cartels, it seems likely that prices will remain low to moderate in real terms over the next decade, with considerable supply induced fluctuation around the trend. As the most important exporter of cocoa in Africa, the Ivory Coast faces a downward sloping demand curve. Since major increases in Ivorian output will

¹Together, these countries account for over half of total world cocoa production.

²Fraternité Matin 26 March 1980, pp. 8-9; 27 March 1980, pp. 10-11, 13; 26 to 27 April 1980, p. 1.

TABLE 48
 COCOA BEAN PRICES
 1955 TO 1978

	<u>Annual Average ICCO Daily Price</u>	
	<u>Current</u>	<u>1977 Constant</u>
	---- (US cents per kilogram) ----	
<u>Actual</u>		
1955	79.4	229.9
1956	57.3	160.1
1957	63.9	172.8
1958	87.5	235.9
1959	72.5	194.9
1960	58.9	155.0
1961	48.5	126.3
1962	45.9	121.0
1963	55.3	145.3
1964	50.5	130.5
1965	36.6	91.7
1966	51.8	128.5
1967	59.7	146.2
1968	72.1	187.8
1969	90.4	233.5
1970	67.5	156.5
1971	53.8	115.5
1972	64.4	124.8
1973	113.1	181.9
1974	156.1	200.6
1975	124.6	138.9
1976	204.6	224.3
1977	379.0	379.0
1978	340.4	295.4
<u>Projected</u>		
1985	330.7	186.3
1990	286.6	126.8

Sources: ICCO Secretariat and FAO, Trade Yearbook (actual);
 World Bank, Economic Analysis and Projections
 Department (projected).

TABLE 49
 COCOA BEANS - WORLD PRODUCTION BY MAIN COUNTRIES AND ECONOMIC REGIONS

	Production (thousands of tons)						Actual and Projected Growth Rates (% per annum)		
	1955	1960	1965	1970	1974/76	1977	1955-77	1977-80	1974/76-90
Latin America									
of which:									
Brazil	142	201	119	201	259	234	3.1	8.6	5.5
Colombia	15	19	17	19	25	27	2.6	2.4	3.7
Dominican Republic	35	40	33	43	29	30	-0.9	-1.7	4.1
Ecuador	33	35	48	55	71	72	3.9	-3.4	0.8
Africa									
of which:									
Cameroon	56	64	91	108	108	82	3.3	11.9	2.6
Ghana	224	322	566	416	375	320	2.6	-4.4	-0.5
Ivory Coast	79	62	148	181	227	230	5.4	9.3	5.3
Nigeria	91	157	298	223	215	165	4.4	10.1	2.9
Asia and Pacific									
of which:									
Malaysia	-	-	1	2	13	21	-	12.6	13.3
Papua New Guinea	1	7	21	22	32	28	-	5.6	2.6
Other Countries not Specified Above	136	143	164	164	147	136	0.4	4.9	0.6
Total Developing Countries	<u>812</u>	<u>1,050</u>	<u>1,506</u>	<u>1,434</u>	<u>1,501</u>	<u>1,347</u>	<u>3.1</u>	<u>5.0</u>	<u>3.1</u>
Total Centrally Planned Economies	<u>3</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total Developed Countries	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
WORLD TOTAL	<u>815</u>	<u>1,053</u>	<u>1,508</u>	<u>1,435</u>	<u>1,502</u>	<u>1,349</u>	<u>3.1</u>	<u>5.0</u>	<u>3.1</u>

- nil, negligible or inexact amount due to small rounded base year figure.
 Figures may not add to totals because of rounding.

Sources: Gill & Duffus, Cocoa Market Report and Cocoa Statistics; World Bank, Economic Analysis and Projections Department.

depress world prices, the nation's strategy must be to ameliorate quality and cut production costs, instead of its past strategy which concentrated on augmenting production.

C. SATMACI as an Organization

The Société d'Assistance Technique pour la Modernisation Agricole de la Côte d'Ivoire (SATMACI) was established in 1958 with no participation--financial, technical, or managerial--from the private sector. This decision is justifiable on a number of grounds. The cost of cocoa and coffee programs is a fraction of the investment required for cotton, palm, or sugar: well within the financial resources of the public sector. The technical challenges are not overwhelming. By the time of SATMACI's creation, peasants already extensively cultivated both coffee and cocoa, the IFCC already had a well established research program, and the French and Ivorian public sectors included trained agronomists.¹ The relatively low investment at stake gave the government a margin of error in coffee and cocoa that could not exist for oil palm or cotton.

Coordinating several programs and a far flung network of agricultural extension agents and loans to peasant collectives

¹SATMACI encountered serious difficulties managing and operating its rice mills. As the parastatal itself admitted, it lacked the technical resources to accomplish the task. Coffee and cocoa, in contrast, require no industrial processing before export.

proved to be beyond SATMACI's managerial capacity. Despite major reforms undertaken from 1970 to 1973, SATMACI's core activities--agricultural extension and rural credit--continue to have problems. Moreover, the parastatal's virtually total dependence on the government for revenue allocations has repeatedly led it into financial straits.

Legal Basis and Mandate. SATMACI is a non-profit state corporation with equity capital of 150 million CFA.¹ The corporation's board of directors has nine members drawn from the central government, the National Assembly, the Ivorian parastatal sector, and the two French governmental agencies for international development (see table 50). Six members constitute a quorum, and decisions require a two-thirds majority. The board elects its chairman. In the event of a stalemate, the chairman casts the deciding vote. SATMACI operates under the supervision of the Minister of Agriculture, and has been subject to the normal administrative controls for state corporations (see Chapter VI).

The 1958 decree creating SATMACI specified the parastatal's mandate: SATMACI was to further, through technical assistance, the modernization of agriculture in the Ivory Coast. The parastatal had two primary financial responsibilities:

¹Arrêté 35/AEP/PLAN/1 of 14 April 1958, which created SATMACI in accordance with the French law of 30 April 1946 regarding state corporations in the French Overseas Empire.

TABLE 50

SATMACI: COMPOSITION OF THE
BOARD OF DIRECTORS (1980)

Number of Seats	Sector Represented	Titles of Board Members
2	central government	Minister of Agriculture Minister of Economy, Finance, and Planning
2	Assemblée Nationale	-
3	parastatals	President of the Stabilization Fund President of the Chamber of Agriculture President of Crédit de la Côte d'Ivoire
2	French government	Mission Chief of Fonds d'Aide et de Coopération Regional Director of the Caisse Centrale de Coopération Economique

Source: BETPA "Centre Ouest," p. 3. Adapted and translated by
the author.

administering funds allocated for agricultural modernization programs and guaranteeing funds loaned to rural collectives. SATMACI's activities were to include: (1) conducting feasibility studies of agricultural programs and assisting in their creation, (2) implementing programs improving agricultural production and introducing modern agricultural equipment, and (3) agricultural extension work.¹

The mandate was narrow in terms of the entire agricultural production process, mentioning neither processing nor marketing agricultural commodities.² In terms of crops, however, the mandate was extremely broad. SATMACI had the authority to intervene in the cultivation of any agricultural product. Cocoa and coffee have always been SATMACI's primary responsibility; from 1971 to 1977 they were its sole responsibility. At various other times, SATMACI has implemented programs for oil palm, coconut, rice, banana, pineapple, integrated rural development, and even livestock. Essentially, SATMACI has functioned both as the primary agency for coffee and cocoa and as an all-purpose agency undertaking the residual agricultural projects for which no specialized agency exists (see table 51).

¹See Article 2 of the 14 April 1958 decree that created SATMACI.

²SATMACI did, however, operate rice mills and purchase rice from farmers from 1965 to 1971. The current Arabusta coffee project includes the construction of a state factory to "wet process" Arabusta coffee from "cherry" to bean.

TABLE 51
 SATMACI: OFFICIAL
 RESPONSIBILITIES 1958 TO 1980

Period of Responsibility	Program	Agency Superseding SATMACI
1960-1962	oil palm	SODEPALM
1960-1966	coconut	SODEPALM
1961-1971	cattle ranches	SODEPRA
1965-1971	rice	SODERIZ
1966-1968	banana	SODEFEL
1967-1969	pineapple	SODEFEL
1958-1980	coffee	
1958-1980	cocoa	
1977-1980	rice	
1977-1980	integrated development of forest zone	

Source: SATMACI

SATMACI's work program, established as a series of conventions (agreements) between SATMACI and either the central government or international donors, is composed of a changing set of disparate projects. During the period from 1960 to 1980, SATMACI implemented at least fifteen separate agreements ranging from major multi-year projects covering thousands of hectares, to small projects (e.g., creating 165 hectares of seedling nurseries), to broad sectoral programs (e.g., the banana sector).¹

Finance. SATMACI obtains almost none of its revenue from sale of its goods and services: it depends upon allocations from international aid donors and the government. Much of the government funding comes from the Stabilization Fund; the rest comes from the BSIE. The government acts as mediator between international donors and SATMACI, so all of SATMACI's revenue flows through the government. Since SATMACI's inception, the government has consistently failed to disburse funds on time.

During the 1960s, SATMACI coped with this unreliable cash flow by taking out short term loans (to fund long term projects). As SATMACI's finances deteriorated, it became clear that the corporation needed a larger capital stock to buffer itself from its uncertain source of revenue. In 1970, the

¹See BETPA, "Centre Ouest" annex 2, pp. 5-7, for a detailed list.

government quadrupled SATMACI's equity, adding 440.4 million CFA, which augmented total equity to 590.4 million CFA.¹ Despite this infusion of capital, SATMACI continued in the red, primarily due to losses in rice milling, bad loans to peasant collectives, and high interest payments on its short term debt. SATMACI lost 58 million CFA in 1970 and 94 million CFA in 1971.

By 1972, the capital increase, which permitted a reduction in short term debt, had made an impact on SATMACI's balance sheet. Some progress was being made on solving the problem of bad loans to farmers. Responsibility for rice purchase and milling had been transferred to a new specialized parastatal, SODERIZ. SATMACI's losses for that year declined to 10.5 million CFA; from 1973 on, the corporation made profits.

Unfortunately, these profits were artificially fueled by burgeoning short term debt. In 1974, long term and short term debt were each around one billion CFA. By 1978, short term debt had risen tenfold and was five times greater than long term debt. Suppliers' credits rose from 329 million CFA to 2.6 billion CFA over this period, while the average length of the credit more than tripled (from less than half a year to over a year and a half).² Bank overdrafts more than

¹In 1978, the 440.4 million CFA was transferred to the accounting status of "cash reserve"--a more accurate description of its use than "equity". The amount was, in fact, only about half of the amount originally expected from the government (775 million CFA).

²The average duration of suppliers' credit peaked in 1976 at 758 days: more than two years.

quintupled between 1975 (1.2 billion CFA) and 1978 (6.8 billion CFA). In 1978 and 1979, overdrafts exceeded the ceilings imposed by the Central Bank, and SATMACI incurred heavy fines. SATMACI's annual cost of carrying debt augmented by a factor of thirteen between 1973 and 1978. Accounts receivable (presumably composed chiefly of committed but undisbursed funds from the government) multiplied eightfold between 1974 and 1978, reaching 8.8 billion CFA. SATMACI is moving towards a financial crisis (see table 52).

Personnel. SATMACI has made public little information on its own workforce. The scant data available indicate that the workforce increased during the 1960s and declined during the 1970s. The data on personnel conflict: the total fluctuates over the course of each year, and different sources use different measures. Perhaps the strangest aspect of the personnel data is that most measures appear to exclude extension agents.¹ (See table 53). The proportion of non-African expatriates in SATMACI's upper management gradually is dwindling: down from 19 in 1973 to 14 in 1978.

Management. SATMACI has encountered serious management problems in its financial, agricultural extension, and rural

¹This is the most obvious explanation for the discrepancies between the Banque des Données Financières' figure for 1974 (3339 employees) and SATMACI's own figure (4470 employees). The difference, 1131 employees, is exactly the number SATMACI lists as extension agents for that year. The other sources' measures are more in line with the Banque des Données Financières than with SATMACI.

TABLE 52

SELECTED FINANCIAL STATISTICS OF SATMACI 1970-1978
(Millions of current CFA)

Year	Profit (loss)	Equity	Medium & Long Term Debt	Short Term Debt			Cost of Carrying Debt	Accounts Receivable From Clients
				Total	Bank overdrafts	Suppliers' Credits		
1970	(58.0)	590.4	n.a. ^a	n.a.	n.a.	n.a.	n.a.	n.a.
1971	(94.4)	590.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1972	(10.5)	590.4	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1973	13.9	590.4	453.1	n.a.	n.a.	n.a.	58.0	n.a.
1974	7.4	590.4	987.6	985.7	n.a.	329.4	66.1	1130.8
1975	10.2	590.4	1165.8	2295.3	1248.0	571.8	65.4	1940.9
1976	8.8	590.4	1612.7	4162.3	2320.9	1250.8	204.4	4125.0
1977	10.5	590.4	1681.5	7103.9	3548.8	1539.4	260.9	6759.1
1978	27.7	150.0	1778.0	10,252.0	6790.5	2645.6	754.1	8768.6

^aMost of the unavailable information on this table exists, but SATMACI has not made it public.

Source: SATMACI

TABLE 53
 SATMACI: SIZE OF WORKFORCE
 IN SELECTED YEARS ACCORDING TO
 SELECTED SOURCES

<u>Year</u>	Source			
	(1)	(2)	(3)	(4)
1973		2100		2047
1974	3339	4470		
1975	3377			
1976	3757			
1977	3763			
1978	2523			2748
1979				
1980			2450	

(1) Banque des Données Financières

(2) SATMACI

(3) BETPA

(4) ONFP

loans operations. The parastatals' financial responsibility for administering funds from a variety of sources led it to adopt an accounting system in which the items were posted according to the source (not the use) of the funds. While this allowed SATMACI to accurately report the state of expenditures for each separate donor's account, the system scattered identical expenditures throughout the corporation's books, rendering impossible the calculation of basic analytical accounting information. The parastatal could only produce rough estimates of its total operating costs, total investment costs, total costs per hectare, or total expense of training staff! In 1973, SATMACI adopted a modern accounting system as part of an overall reorganization that had begun in 1969. The new system gives SATMACI the capacity to administer funds cost-effectively.

SATMACI relies heavily on its agricultural extension agents. During the 1960s, however, these agents performed very poorly, due to their lack of qualifications and to severe flaws in the parastatal's management. Authority was highly centralized, yet little accurate information on the status of production or agents' work programs was transmitted from field to headquarters. The corporation hired extension agents during the early 1960s--an era when average educational qualifications were much lower than at present. Training extension agents was, therefore, particularly important, yet it was not until 1970 that SATMACI established a department responsible for

employee education.

A French agricultural research institute, the BDPA, tested in 1969 a sample of 143 SATMACI agents responsible for coffee and cocoa.¹ The examination evaluated basic skills in French, mathematics, and logic; eighty points out of a possible one hundred and sixty was the passing grade.² The extension agents' average score was twenty-seven. Only twenty-five percent of the agents passed the test; only eleven percent passed the section on mathematics. Nineteen percent actually obtained negative scores!

Trying to ascertain the causes of this appalling performance (which implied that seventy-five percent of coffee and cocoa extension agents lacked even the minimum qualifications for their work), the BDPA found that some extension agents had worked for up to four years yet never attended the IFCC's basic training course in coffee and cocoa. Others had attended two courses in two years.

The lack of information flow between headquarters and field stemmed in part from the agents' lack of the basic skills needed to quantify results and forecasts, and to communicate them to their supervisors. In addition,

¹The sample was 135 extension agents, and 8 assistants, out of a total population of 530.

²SATMACI had administered this test to screen candidates for employment as rice extension agents. The minimum acceptable score was 50/160.

communication and transportation infrastructures during the early 1960s were poor.

Extension agents lacked the logistical support required to carry out their duties. The BDPA study found many agents did not even have appointment books to make a record of past activities and plan future ones. Their means of transportation, generally mobyette, was not built to withstand the rigors of the African bush, yet the relatively light density of extension required the agents to travel. Extension agents were transferred every two or three years, which disrupted whatever fragile continuity had been created. Agents rarely knew of the existence of plantations for which they were not responsible. Their salaries were low, their prospects of promotion were limited, and their performance was not supervised closely by headquarters, so they tended to apply little effort to their jobs. Given SATMACI's admission of theft and embezzlement at the rural distribution centers, it seems likely that some of the problems SATMACI had with keeping track of the inventory of its rural distribution centers resulted from extension agents selling materials for their personal gain.

In 1969, SATMACI recognized that its agricultural extension program desperately needed improvement. A French management consulting firm, the Compagnie Française d'Organization (COFROR) was called in.¹

¹The Compagnie Française d'Organization was later acquired by Peat, Marwick, and Co.

The consultants pinpointed SATMACI's chief problems as over-centralization of authority accompanied by a virtually complete lack of accurate information from the field. SATMACI was found deficient in the management of personnel, finance, and materials.

Personnel problems existed both at headquarters and in the field. Certain categories of jobs were ill defined. Fieldworkers accepted little responsibility, referring even minor decisions to headquarters. Personnel management in the field was unsatisfactory, and extension agents provided headquarters with unrealistic or imaginary information, and hence worked with unrealistic or imaginary targets.

Financial difficulties stemmed from the unsuitable accounting system that offered no approximation of the cost of production or break-even price. Faulty field information and poor communication produced unrealistic predictions of rice harvests. SATMACI held the responsibility of purchasing rice, but in the absence of accurate predictions frequently failed to have the correct sum available at the appropriate time.

SATMACI also encountered problems in providing materials to its network of rural warehouses and distribution centers, many of which were unwarranted by local demand for materials.¹

¹The centers and warehouses were often redundant--a single supply infrastructure would have been more efficient.

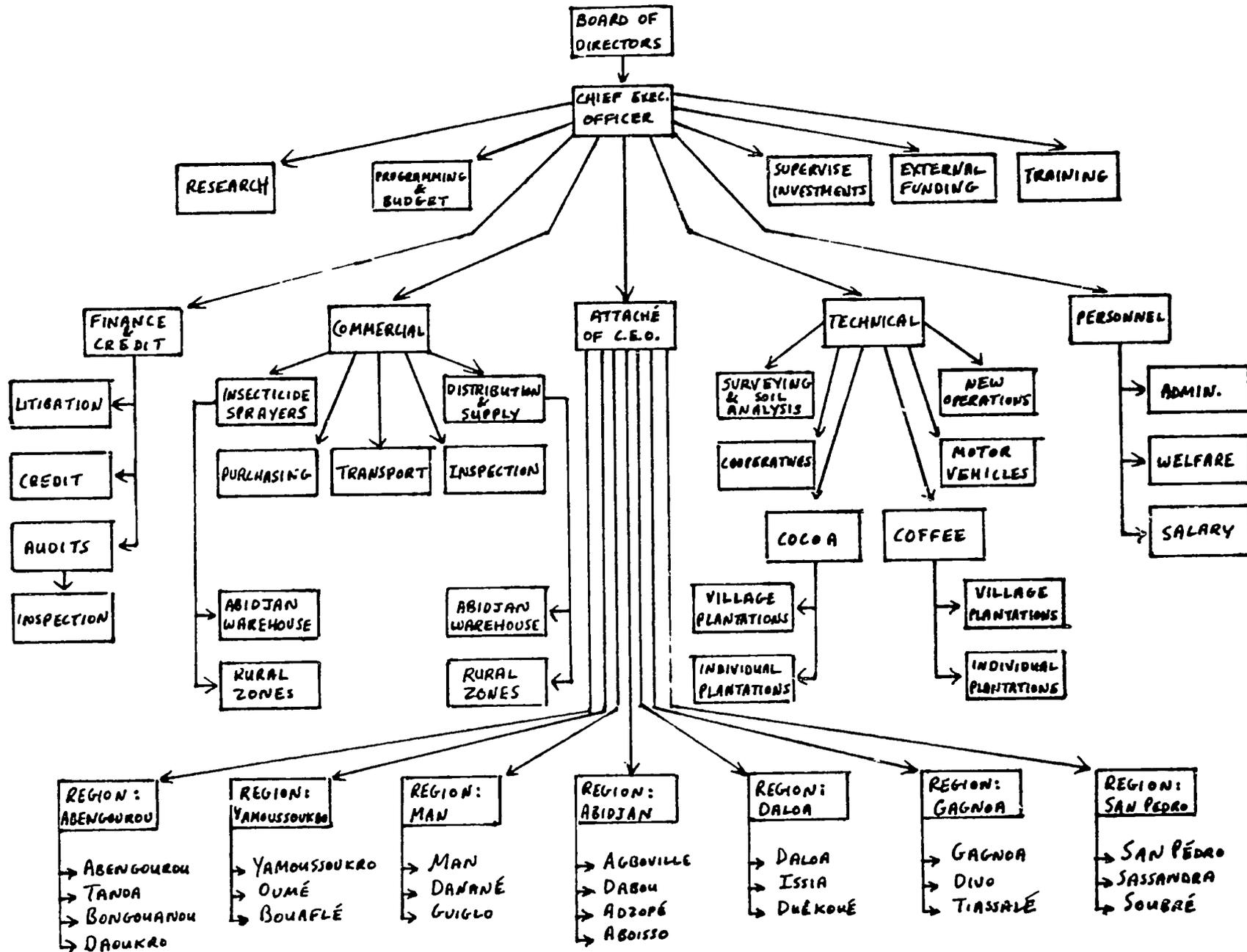
The truck fleet was plagued by empty runs that raised shipping costs. SATMACI had no effective system to keep track of the rural centers' inventories, leading to shortages and gluts of materials and allowing graft at the distribution centers to attain rampant proportions. In 1971, SATMACI implemented COFROR's program of reorganization. The basic goals were outlined in horatory style:

1. To clarify job descriptions (no task without someone responsible for it, no employees without tasks)
2. To utilize ambitious but realistic targets, in encouraging employees' dynamism and self-improvement
3. To decentralize authority to the field, giving lower echelons initiative and the chance to exercise creativity
4. To encourage teamwork, discussion, rigorous work and fulfillment of obligations
5. To make all employees interested in attaining goals set through a dialogue with their supervisors
6. To obtain key cost data (e.g., cost per hectare planted, cost per seedling)
7. To obtain progress reports that rapidly indicate failures to meet schedule.

SATMACI has made public no information on the actual mechanics and the effectiveness of its reorganization.

Comparing the corporation's organizational chart immediately following its restructuring (see figure 19) with a chart of its organization in 1980 (see figure 20) indicates that the formal structure endured largely intact during the eight year period. This suggests either that SATMACI has been satisfied with the results, or that it has been reluctant to

ORGANIZATIONAL CHART OF SATMACI 1971

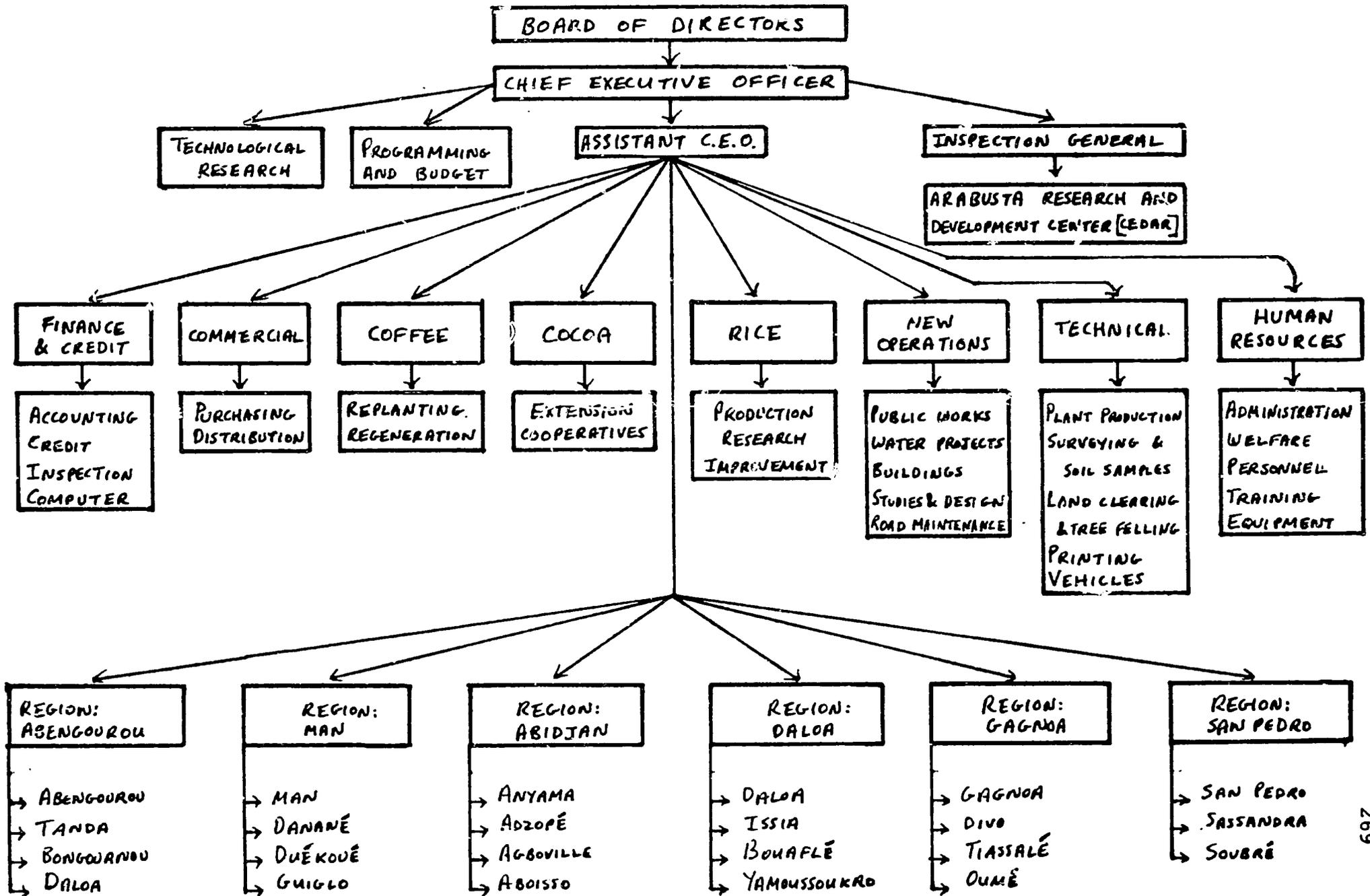


Source: SATMACI.

Adapted and translated by the author.

FIGURE 20

ORGANIZATIONAL CHART OF SATMACI 1980



SOURCE: BETPA, "CENTRE OUEST," appendix 1; SATMACI. ADAPTED AND TRANSLATED BY THE AUTHOR.

make further changes.

SATMACI has three tiers: top management and staff, functional department, and regional fieldwork divisions. The only major change since 1973 occurred in the technical department, which was split into five administrative units (technical, new operations, cocoa, coffee, and rice). Reflecting its top priority, the new Arabusta development program was attached directly to the chief executive officers' office.

Other Organizations Involved in the Coffee and Cocoa Sectors.

Agricultural research on coffee and cocoa is carried out by the Institut Français du Café et Cacao (IFCC), which is based in Bingerville and has research stations in Divo, Guiglo, and Abengourou. The IFCC tests various cultivation techniques, fertilizers, and insecticides, and develops new hybrids of cocoa and coffee. It has developed high yield strains of cocoa (notably the F2 hybrid). Perhaps its most important contribution is the recent development of Arabusta coffee. Arabusta combines the disease resistance and high yield potential of Robusta with the flavor of high priced Arabicas and an ability to withstand drought. Although the IFCC selects the hybrid stock, SATMACI is responsible for the mass distribution of the new varieties.¹

¹Currently, SATMACI manages thirty-seven regional centers to develop plant material and seedlings.

The Office Nationale pour la Promotion Rurale (ONPR), which replaced CENAPEC, encourages and trains peasant collectives. The cooperative movement has expanded greatly, reaching 1655 collectives in 1978. The chief source of cooperatives' popularity is the material benefits (bonuses, loans) the government makes available to members. Eight ONPR staff members cover over three hundred collectives in the Center West; clearly they can do little more than provide a minimum of technical advice.

Rural credit is provided by the Banque National pour le Développement Agricole (BNDA), which makes a variety of loans directly to peasants who belong to a collective. The BNDA's staff is limited, and they do not reside in the villages. It seems likely that the main recipients of direct BNDA loans are the wealthier farmers who seem obviously good credit risks. Most BNDA loans, however, are administered (and guaranteed) by SATMACI as part of the coffee and cocoa planting programs.

XIII. PARASTATALS IN THE COFFEE AND COCOA SECTORS: SATMACI
AND SMALLHOLDER COFFEE AND COCOA CULTIVATION

A. The Structure of Peasant Production.

Coffee and cocoa are cultivated primarily by smallholders. Eighty-four percent of the 443,295 farms in the southern Ivory Coast recorded by the 1974/75 agricultural census included some coffee and/or cocoa. Coffee hectarage alone occupies over half of all cultivated land in the southern Ivory Coast (see table 54). The bulk of coffee and cocoa production comes from farms between two and ten hectares. Ninety-four percent of these holdings include some coffee or cocoa (see table 55). The vast majority of farmers rely on traditional cultivation techniques: over two-thirds of Ivorian coffee is grown in mixed stands with food crops (see table 56). The scanty evidence on hybrid cocoa indicates that even under intensive agricultural extension, farmers' tree density averages only three-quarters of the optimal 1320 trees per hectare.¹ A 1977 study of

¹Much of the labor for Ivorian commercial agriculture is supplied by the roughly 1.5 million migrants from Upper Volta and other neighboring countries. For a description of the types of contracts through which these migrants are hired, see: Stavenhagen, "Agricultura Comercial," pp. 170-173; and International Coffee Organization, "Ivory Coast," p. 24.

TABLE 54

COFFEE IN AGRICULTURAL HOLDINGS:
THE SOUTHERN IVORY COAST 1974/75

Size of Holding	All Holdings		Holdings with Coffee			
	Number of Holdings	Area Cultivated (ha)	Number of Holdings	Area Cultivated (ha)	Percentage of:	
					(Holdings) 3÷1	(Area) 4÷2
	(1)	(2)	(3)	(4)	(5)	(6)
Below 2 ha	104,218	118,901	46,420	36,665	44.5	30.8
2 to 10 ha	282,149	1,372,145	249,207	705,748	88.3	51.4
More than 10 ha	57,028	885,354	52,660	494,271	92.3	55.8
Total	443,395	2,376,400	348,287	1,236,684	78.6	52.0

Source: Agricultural Census 1974/75; c.f. International Coffee Organization, "Ivory Coast," p. 20.

TABLE 55

EXTENT OF COFFEE AND COCOA CULTIVATION
BY SIZE OF LANDHOLDING IN THE SOUTHERN
IVORY COAST 1974/75

Size of Landholding (ha)	(1) Total Number of Holdings	(2) Number of Holdings Growing Both Coffee and Cocoa	(3) Number of Holdings Growing Only Coffee	(4) Number of Holdings Growing Only Cocoa	(5) Number of Holdings Growing Neither Coffee nor Cocoa	(6) Percent of total Holdings Growing Neither Coffee nor Cocoa = (5) ÷ (1)
0.5	15,497	179	1,018	231	14,069	90.8%
0.5- 0.99	24,248	1,454	6,023	1,407	15,364	63.4
1.0- 1.99	64,473	13,014	24,742	4,089	22,628	35.1
2.0- 4.99	161,897	64,092	73,019	11,101	13,678	8.4
5.0- 9.99	120,159	76,658	35,428	5,835	2,238	1.9
10.0-19.99	47,586	35,276	8,236	3,171	903	1.9
20.0-49.99	9,157	8,071	911	21	154	1.7
50.0-99.50	285	157	9	17	102	35.7
Total	443,295	198,901	149,386	25,872	69,136	15.6

Source: Lee, "Ivory Coast," p. 13. Lee's data is from the Census of Agriculture 1974/75, table 6-2-5.

TABLE 56

TYPES OF COFFEE CULTIVATION IN THE
IVORY COAST 1974/75

Type of Cultivation	Tree Density (per ha)	Area		Estimated Number of Trees (million)
		(000 ha)	Percentage of Total	
	(1)	(2)	(3)	(4)
1. Pure stand	1,000	378	30.6	378
2. Mixed (predominant) coffee as main crop	980	670	54.2	657
3. Mixed (subsidiary) coffee as secondary crop	330	189	15.2	62
4. Total area under coffee	887	1,237	100.0	1,097

Source: International Coffee Organization, "Ivory Coast," p. 22. The ICO's data is from the Ivorian Agricultural Census 1974/75.

hybrid cocoa growing in pure stands in the Center and West of the Ivory Coast found that fifty-seven percent of the trees (aged from four to seven years) were barren.¹

B. The Task of Cultivating Cocoa and Coffee

Unlike raw cotton and fresh oil palm fruit which must be industrially processed before export, coffee and cocoa can be exported after smallholders have processed the raw fruit in a relatively simple and inexpensive manner. Thus, the financial stakes involved in the production of exportable coffee and cocoa are relatively low. Ivorian agro-industries processing coffee beans into instant coffee and cocoa beans into chocolate products do represent substantial investments. However, these industries consume only a small fraction of national production and could utilize cocoa and coffee exported by neighboring West African countries if a severe local shortage developed. Supplies of raw material are a major source of uncertainty for Ivorian cotton ginneries and oil mills, but not for the Ivorian coffee and cocoa food processing industries.

Cocoa. Cultivating cocoa to achieve the optimum yield is a complex task, demanding hybrid stock raised properly in nurseries and planted (1320 seedlings per hectare) in

¹The results are set out in an unofficial document of the Ministry of Agriculture, compiled in 1980.

appropriate soil with appropriate shade and fertilizer, and with timely weeding and applications of insecticide. Output attains up to three tons per hectare at agricultural research stations.

Minimal yields of about 350 kilograms of marketable cocoa per hectare can be obtained through simple and traditional cultivation techniques. Cocoa seeds from nearby plantations are sowed directly in a field previously devoted to food crops. Often, food crop cultivation continues alongside the cocoa seedlings. In other cases, the land is temporarily abandoned and luxuriant weeds provide the young seedlings with shade. The first weeding usually is carried out in the fourth or fifth year, immediately preceding the first harvest. Thereafter, plantations are weeded once a year. Harvests gradually increase to a peak of roughly four hundred kilograms of marketable cocoa beans per hectare per year during the eleventh to fifteenth years, and then slowly decline, producing negligible harvests from about the thirty-fifth year onwards (see table 57). Migrants who must work on other proprietors' plantations generally utilize this labor saving cultivation technique on their own cocoa hectare, and eschew contact with the government cocoa program.¹

Hybrid stock cultivated by smallholders utilizing modern

¹See BETPA, "Centre Ouest," annex 2, p. 26.

TABLE 57
LIFE CYCLE OF COCOA TREES UNDER
TRADITIONAL CULTIVATION IN THE
SOUTHEASTERN IVORY COAST

Years	Yield (kg/ha) ^a	Observations
-2 to -1	None	Farmers clear land, cultivate food crops
0 to 4	Negligible	Farmers plant cocoa amid food crops Tend seedlings
5 to 7	75	
8 to 10	250	Increasing harvests
11 to 15	395	Peak harvests
16 to 20	325	
21 to 25	305	Declining harvests
26 to 30	250	
30 to 45		Plantation is abandoned, or the trees are cut down and the land is planted in food crops and cocoa.

^aKilograms of marketable cocoa beans.

Source: Adapted from Société d'Etudes pour le Développement Economique et Sociale, "Region du Sud-Est; Etude Socioeconomique" (Abidjan: Ministère du Plan, April 1967), vol. 3, p. 181; c.f. Elliott, "Benefit-Cost Analysis," p. 214. The adaptations are based on information in BETPA, "Centre Ouest," annex 2, p. 26, and Dian Boni, "Le Pays Akyé (Côte d'Ivoire); Etude de l'Economie Agricole," Annales de l'Université d'Abidjan Séries G: Géographie, vol. 2, fascicle 1 (1970), pp. 151-152.

agricultural techniques begins producing sooner than traditional cocoa, and rapidly (the eighth year) reaches an average peak production of one ton per hectare per annum. Yields on particularly well tended plantations considerably exceed these averages. In one recorded case, hybrid cocoa began producing after only twenty-six months; in another, plantations with trees aged two to four years old yielded a harvest of eight hundred kilograms per hectare. However, most observed yields of hybrid cocoa lie considerably below estimated potentials, although they greatly exceed observed yields of traditional unselected Amelondo Pocai stock (see table 58).

The cocoa harvest lasts from June to February, with peak yields from October to January. From June to September, the ripe pods must be collected at least every three weeks. During the peak season, plantations should be harvested at least every two weeks. Immediately after harvesting, the cocoa pods must be fermented: a fairly demanding procedure upon which the future quality of the cocoa beans depends heavily. Since 1979, SATMACI has promoted modern fermentation techniques, but most farmers continue to produce mediocre quality beans by fermenting their pods on banana leaves or even on the ground.

Fermentation takes about a week, after which the farmer must discard the shell and pulp, and dry the beans. Like fermentation, proper drying is not arduous, but it demands

TABLE 58

COMPARISON OF ANNUAL ESTIMATED AND OBSERVED
YIELDS OF COCOA (kilograms of marketable cocoa per hectare)

Year	Observed Average Yield: Traditional Stock ^a	Observed Average Yield: Hybrid Stock ^b		Observed Average Yield: Hybrid Stock ^c		Observed Maximum Yield: Hybrid Stock ^d	Estimated Yield: Hybrid Stock ^c		Estimated Yield: Hybrid Stock ^e
	(1967)	(1977/78)	(1978/79)	(1977)	(1978)	(1979)	(fertilizer)	(no fertilizer)	(fertilizer)
0	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-
4	-	100	n.a.	123	n.a.	800	200	-	150
5	75	148	310	170	326	-	500	200	300
6	75	205	316	195	316	2,500	700	400	500
7	75	295	380	289	380	-	900	550	800
8	250	n.a.	405	n.a.	405	-	1000	700	1000

a Source: Société d'Etudes pour le Développement Economique et Sociale, "Sud-Est," vol. 3, p. 181.

b Source: Ministry of Agriculture, unofficial report, 1980.

c Source: BETPA, "Centre Ouest," pp. 13-15. The hybrids were planted in the first Cocoa Project, which lasted from 1971 to 1974.

d Source: BETPA, "Centre Ouest," p. 22. These yields are not on research stations.

e Source: BETPA, "Centre Ouest," Appendix 9, tables 1 and 2. These are yield estimates for cocoa currently being planted.

assiduous care. The beans must be separated from the shell and pulp, spread in a thin layer, stirred frequently, and sheltered from rainfall. Excessive dampness ruins the beans. Once the cocoa is completely dry, the farmer bags the beans and generally sells them as soon as possible to avoid spoilage in storage and to assure a relatively regular stream of cash revenue.¹

Once cocoa trees begin to produce, the input that most dramatically affects yield is insecticide. Capsids, a family of insects flourishing throughout West Africa, feed on cocoa trees, creating puncture wounds that kill the young shoots. The damage retards the trees' maturation, and ultimately kills them. Effective control of capsids requires two applications of insecticide, in July and in September. Each treatment must consist of an initial spraying to eradicate the current capsid population followed by a second spraying a month later to eliminate their offspring. Without a timely second spraying, the first spraying has little long term effect. Plantations properly treated with insecticide produced yields averaging almost thirty-six percent higher than yields in comparable plantations that had received no

¹For a good description of the traditional techniques of cocoa harvesting, fermentation, drying, and sales, see Dian Boni, "Le Pays Akyé (Côte d'Ivoire); Etude de l'Economie Agricole," Annales de l'Université d'Abidjan Séries G: Géographie, vol. 2, fascicle 1 (1970), pp. 151-152.

treatment.¹ Anti-capsid treatment is the most important part of the Ivorian cocoa "regeneration" program.

Rainfall, a key factor in oil palm and cotton yields, is of secondary importance in cocoa production. Farmers generally plant cocoa on the finest land available. Drought must reach serious proportions before it significantly depletes the moisture content of the best soil. Despite a general pattern of diminished rainfall in the forest zone during the latter 1970s, average cocoa yields increased, reaching the record level of 544 kilograms per hectare in 1978/79--the same year that village oil palm production fell to a record low percentage of target.²

Coffee. Like cocoa, obtaining optimum yields from coffee requires a complex set of inputs. Hybrid seedlings must be raised in nurseries, then planted (with a cover crop), weeded, and treated regularly with fertilizer and insecticide. Current hybrid Robusta annually produces up to 2.5 tons of marketable coffee per hectare under the most advanced

¹See: Société d'Etudes pour le Développement Economique et Sociale, "Région du Sud-Est; Etude Socioeconomique" (Abidjan: Ministère du Plan, April 1967), vol. 3, p. 182; c.f. Elliot, "Benefit-Cost Analysis," pp. 208-209.

²For an interesting quantitative analysis of cocoa yields as a function of technological progress and cyclical variation, see M. Mandel, "Etude Preliminaire de la Variation Annuelle du Rendement de Cacao en Côte d'Ivoire" (Abidjan: ASI'CNA, January 1980). In a later unpublished study, Mandel examines the effect of climate on yield.

cultivation techniques. Usual estimates of hybrids' annual yield under smallholder cultivation are nine hundred to one thousand kilograms per hectare. Minimum yields of about three hundred kilograms per hectare of pure stand can be obtained by planting the coffee directly in a field and thereafter doing little but clearing the underbrush once a year, applying powdered insecticide against red ants (to facilitate the harvest) and picking the beans.

Traditional coffee plantations aged between eight and twenty years growing on fertile soil can be "regenerated." Yields climb from their former level of 300-350 kilograms per hectare to an average of 700 to 750 kilograms per hectare over the course of the four year regeneration cycle. The process, however, is demanding. In the first year, farmers must clear the brush between their coffee trees, severely prune each tree, leaving only a single "sap collector" branch, paint the trees' wounds with coal tar, hoe between rows and around each tree, sow a cover crop, and weed the trees and cover crop six to eight times. The second year, farmers must remove the "sap collector" lightly prune the new shoots, and continue weeding. During the third and fourth years, farmers maintain the trees and cover crop.

A coffee tree's productive life cycle ranges from twenty-five to thirty-five years, depending upon the care with which it has been tended. Trees generally begin producing the third year after planting. Bumper crops exhaust the trees,

so coffee harvests tend to fluctuate, a bad year following a good one (see table 59).

The harvest takes place once a year, and creates a serious labor bottleneck. Ideally, only ripe berries should be picked, but in practice the trees are harvested only once and all berries are picked. This gives African Robusta its characteristically bitter flavor. Robusta coffee is hulled when dry: the coffee "cherries" must be dried until their skins are black and will crack. Only desiccated "cherries" produce top quality beans. In the Ivory Coast, the harvest falls during the little rainy season, which renders the drying process difficult.¹

Once dry, the coffee can be hulled. Small motorized hullers are utilized, and there are also a few factories which hull coffee on an industrial scale. Most coffee is hulled in November and December, but farmers without easy access to a huller may have to wait as late as February to process their coffee. The new Arabusta hybrid requires wet processing--pulping and washing--typical of Arabica strains. Small wet processing hullers are common elsewhere in Africa (e.g., in the Cameroon highlands); introducing wet hulling will not significantly alter the coffee cultivation process in the Ivory Coast.

¹See, for instance, Fraternité Matin 28 May 1980, p. 11.

TABLE 59

PRODUCTIVE LIFE CYCLE OF COFFEE IN THE
IVORY COAST UNDER TRADITIONAL AND ADVANCED
SMALLHOLDER CULTIVATION

Year	Traditional Smallholdings ^a		Advanced Smallholdings ^b	
	Southeast (1970)	Center West (1970)	PAIR and AVB ^c	SATMACI
0	-	-	-	-
1	-	-	-	-
2	-	-	-	-
3	310	310	500	500
4	310	310	1000	900
5	470	398	900	700
6	"	"	1000	600
7	"	"	900	500
8	"	"	1000	600
9	"	"	900	500
10	560	474	etc. ^d	etc. ^d
11	"	"		
12	"	"		
13	"	"		
14	"	"		
15-19	350	297		
20-25	320	272		
26+	320	272		

a Source: Elliot, "Benefit-Cost Analysis," p. 113.

b Source: International Coffee Organization, "Ivory Coast," p. 57.

c Projet Agro-Industriel des Robustas (PAIR); Autorité pour l'Aménagement de la Vallée du Bandama (AVB).

d The pattern of good year/bad year harvests continues.

The hulled beans must be sorted, a tremendously time consuming task which is usually consigned to women. An average of ten to twenty percent of the beans are discarded as unacceptable. The sorted coffee can be bagged and sold. Farmers who prefer not to hull their coffee can sell their dried cherry to SERIC, a manufacturer of processed coffee products, for half of the official producer price for beans.

The most problematic input for Ivorian coffee is rainfall. Smallholders in general plant coffee only on land unsuited for cocoa and these poorer soils tend to be susceptible to drought. In addition, Robusta coffee is particularly vulnerable to deficient precipitation. Coffee yields in the Ivory Coast, therefore, fluctuate greatly from year to year. Insecticide, fertilizer, a cover crop, weeding, and pruning also affect production, but most Ivorian coffee benefits from none of these inputs. Thus rainfall remains the key variable.

C. Coffee and Cocoa Production as a Joint Venture

The production process begins with agricultural research. Actual Ivorian yields are only a fraction of the potential of the Institut Français du Café et Cacao's hybrid strains of cocoa and coffee. Thus, the binding constraint on output is currently not the quality of the trees, but the cultivation, harvesting, and processing techniques employed.

Farmers volunteer for SATMACI's coffee and cocoa programs.

Providing their land is not the subject of property litigation, SATMACI surveys the land and tests the soil and terrain to determine whether the parcel is appropriate for cocoa or coffee. If the holding exceeds a certain minimum size¹, and the soil and terrain prove satisfactory, the farmer enrolls officially in the program. SATMACI provides technical and material assistance; the farmer provides land and labor. Later, the farmer reimburses SATMACI for a fraction of its contribution.

During the year before planting, SATMACI extension agents educate farmers in cultivation techniques. The farmer is responsible for following SATMACI's technical guidelines in establishing a plant nursery and later in caring for the seedlings. SATMACI provides seedlings, and maintains surveillance over the condition of the nurseries.

The farmers, with the technical assistance of SATMACI extension agents, lay out the future plantation, dig the holes for the seedlings, and plant them. Thenceforth, farmers maintain their plantations by weeding, pruning, applying fertilizer, replacing dead trees with seedlings and, in the case of cocoa, spraying the trees with insecticide. After the third year following planting, SATMACI's contributions diminish. Its main remaining activity is making available

¹For the 1971-1974 cocoa program, the minimum size was one hectare.

in rural distribution centers the material inputs required for advanced methods of tree crop cultivation (see tables 60 and 61).

Smallholders harvest and process their crop with no technical supervision although SATMACI does make some modern equipment available (e.g., for cocoa fermentation). Private traders purchase the crop. Farmers have the option of marketing their coffee individually or through a cooperative. The government has encouraged rural collectives through direct intervention (CENAPEC, ONPR) and monetary incentives (loans to members of collectives).

Farmers frequently fail to fulfill their responsibilities in the production process just outlined. To some extent, this is a consequence of SATMACI's near total lack of leverage over smallholders once they receive their seedlings. The tree crops will produce even without the inputs SATMACI supplies. Fertilizer, sprayers, insecticide, and seedlings can be bought on the open market. In theory, the cocoa planting bonus paid at the end of the first and second years is an incentive to follow SATMACI's guidelines, but in practice farmers seem to receive the bonus regardless of their plantations' condition.¹ Official producer prices offer no

¹See BETPA, "Centre Ouest," annex 2, p. 25. In fact, farmers have in the past expanded cocoa hectareage at a rate hardly influenced by planting bonuses. See Elliott "Benefit-Cost Analysis," p. 195 for an example.

TABLE 60

DIVISION OF LABOR BETWEEN SMALLHOLDERS AND SATMACI FOR COCOA PRODUCTION

Year	SATMACI's Tasks	Farmers' Tasks
0	Extension work: education of farmer Evaluation of soil and terrain Providing 50 high-yield cocoa hybrid seed pods	Construction of nursery Raising 1500 seedlings for each hectare planned
1	Provide technical advice Provide fertilizer on credit ^a Provide cash loan or bonus ^b	Clear land, leaving shade for cocoa seedlings Care of nursery Space out holes for seedlings Dig holes, plant seedlings Cover with straw
2 and 3	Provide more high-yield cocoa hybrid seed pods Provide insecticide on credit Provide fertilizer on credit ^a Provide sprayer for purchase, provide credit for part of the cost of the sprayer Provide technical assistance Provide cash loan or bonus	Raise new seedlings in nursery Replace dead seedlings with new ones Apply new straw, and weed four times a year. Apply insecticide (requires purchasing all or a share of a sprayer, and purchasing insecticide). Two sprayings necessary Apply fertilizer (requires purchasing fertilizer)
4	Provide insecticide Provide boxes for fermenting cocoa Provide insecticide on credit	Apply straw, and weed four times a year Apply insecticide (two sprayings) Pruning young cocoa trees Harvest ripe pods, ferment them, then dry them
5 and following years	Provide insecticide Provide boxes for fermenting cocoa	Same as for year N+4. but two applications of insecticide are recommended (each one requires two sprayings)

^aAfter 1971, fertilizer was only applied in year N+1.

^bBefore 1975, SATMACI provided a cash loan of 14,000 CFA over years N+1 to N+3. From 1975 on, SATMACI provided a cash bonus of 60,000 CFA over years N+1 and N+2.

Note: Dried fermented cocoa is purchased by representatives of private buyers designated by the government.

Source: Bureau d'Etudes Techniques des Projets Agricoles, "Projet de Développement Agricole Intégré de la Région du Centre Ouest; Etude de Factibilité," Annex 2 "Les Actions de Développement Récentes et Actuelles" (Abidjan: BETPA, April 1980), appendix 5, appendix 6.

TABLE 61

DIVISION OF LABOR BETWEEN SMALLHOLDERS AND
SATMACI FOR COFFEE PRODUCTION

Year	SATMACI	Farmer
0	Educate farmer re: coffee cultivation Determine suitability of farmer's land for coffee cultivation Survey the land Provide 1500 seedlings and 1500 plastic sacks per hectare	Select land free from litigation Establish nursery, replant seedlings in sacks, tend nursery
1	Provide insecticide Provide technical assistance in correctly spacing holes for seedlings Provide additional seedlings and sacks	Clear the land Tend the nursery: water seedlings, maintain shade, apply insecticide, remove unhealthy seedlings Dig 1320 properly spaced holes per hectare; plant the seedlings Weed Replant additional seedlings in the nursery
3	Provide technical assistance in pruning Diagnose and prescribe treatment for unhealthy seedlings on plantation	Replace dead seedlings on plantation with additional seedlings Prune: select four shoots per plant, cut the rest Apply insecticide, fertilizer and straw on plantation
4 and older	No responsibility for technical assistance Make available fertilizer and insecticide	Apply insecticide and fertilizer as needed Weed, place straw around trees In year seven, prune trees

Source: BETPA, "Centre Ouest," appendix 11. Translated and adapted by the author.

premium for quality, which provides no incentive for farmers to follow SATMACI's cultivation guidelines.

SATMACI purchases no coffee or cocoa, and so has no way to ensure that farmers use their cash receipts to pay their debts. Defaulted debts to SATMACI have risen to alarming proportions, especially since knowledge has filtered back to producers that the fraction of the FOB price they receive is very low. SATMACI's social welfare role precludes the heavy-handed tactic of throwing masses of peasants into jail for defaulted debt payments. Over half of SATMACI's smallholder loans are in arrears; over one-third of indebted smallholders have paid nothing whatsoever!¹

In the absence of either coercion or strong incentives to adopt modern techniques, farmers tend to cultivate coffee and cocoa with traditional methods. Thirty-five percent of the 1971-1974 Center West cocoa program seedlings died from neglect and drought.² Migrant laborers constitute a substantial proportion of the agricultural workforce. These migrants are usually illiterate and often are reluctant to put forth the extra effort required by advanced cultivation techniques. SATMACI extension agents complain of meeting on plantations

¹See BETPA, "Centre Ouest," annex 2, pp. 16-17.

²See Ibid., p. 10.

only hired laborers who ignore the agents' advice. Some technical ameliorations, notably motorized anti-capsid sprayers, pose difficult organizational problems for smallholders. Too expensive for an individual peasant to purchase, a sprayer is generally owned by a collective of twenty to twenty-five farmers. Collectives' size and geographical dispersion make it very difficult to schedule spraying so all members carry out the proper anti-capsid treatments at the optimal time of year.

SATMACI's culpability in low yields is the subject of debate. Some studies indicate that SATMACI has performed well. The Ministry of Agriculture polled farmers in the Center West 1971-1974 cocoa project, and found that SATMACI extension agents had visited eighty-six percent of participating farmers' seedling nurseries at least once a month. Agents provided technical assistance to ninety-seven percent of farmers laying out, digging holes for, and planting seedlings. They also assisted sixty-five percent of planters in later stages of establishing their plantations (insecticide treatments, fertilizer, weeding, and pruning).¹

This positive description contrasts with all other accounts. The BDPA study described previously found that extension workers lacked the basic skills necessary for their jobs.² Extension workers are evaluated largely on their ability

¹See BETPA, "Centre Ouest," annex 2, p. 16

²See page 264.

to meet narrow targets (e.g., liters of insecticide distributed, hectarage planted, hectarage regenerated). They have little incentive for undertaking other crucial tasks, such as explaining to smallholders the terms of their debt to SATMACI or how exactly to utilize the inputs distributed.¹ Deniel (1976:191) describes a case in which agents persuaded Ano farmers to purchase insecticide, but did not bother to inform them of the current method for treatment. As a result, the peasants inadvertantly killed many of their coffee trees. Extension agents may half-heartedly carry out even activities that comprise part of their performance evaluation. Deniel (1976:190-191) quotes disgruntled Ano farmers:

To have my field surveyed, I sent people to Prikro (the nearest town) to get the agent. For him I killed chickens, I had my wife prepare food, and he did not come. To this day, my plantation is not measured and I am still waiting.

For the agent to agree to come, you must pay for his trip, even though he is paid by the administration. That breaks our hearts...

The agents take our money, spend their time looking for women in the village, and then return to town.²

Extension agents' attentions in the Divo region have been highly variable. There are no routine site visits. Soil samples and land surveys are not always done.³

¹One probable cause of defaulted debt payments to SATMACI is that peasants frequently do not learn the exact terms of their financial obligations to SATMACI until the debt is due or overdue.

²Translated by the author.

³The information is from discussions with Robert Hecht in Abidjan, April 1980.

SATMACI transfers its extension agents frequently: the average tenure is only about two years. In a sample of fifteen villages investigated in 1979, none of the SATMACI agents interviewed knew of any cocoa or coffee planted between 1971 and 1975! Agents generally have no idea which farmers already have plantations and which do not. This not only hinders the agents' efforts to provide intelligent technical assistance to the farmers in their zone, but also keeps the agent from effectively applying moral suasion to convince farmers to pay their debts to SATMACI. Once the agent who assisted smallholders to establish their plantations is replaced, farmers' sense of obligation for goods and services rendered attenuates.¹

SATMACI's problems with its rural credit programs stem not only from laws in the management of agricultural extension and lack of leverage (i.e., no purchasing of tree crops), but also from an unsatisfactory system of record keeping and a misperception of rural social structure. Loans are channeled through collectives. SATMACI classifies the loans according to the collective through which the money is administered, not according to the farmer receiving the loan. Thus, a farmer belonging to several collectives can obtain multiple loans.

¹During the 1960s, SATMACI attempted to replace its extension system consisting of agents residing in their zones with a less expensive mobile team responsible for a wide area. The peasants' response was noted in SATMACI's 1968 annual report: "the removal of the (resident) agricultural extension agent is very bad for repayment of debts--the peasants consider that the removal erases their debt." SATMACI, Rapport Annuel Opération Cacao (1968), pp. 36-7; c.f. Elliott, "Benefit-Cost Analysis," p. 212.

Even if he is already in arrears, SATMACI has no means whatsoever to identify him as a credit risk. A farmer who obtains more than one kind of loan, even through the same collective, appears in SATMACI's books as a separate borrower for each loan.

Collectives were intended to promote rural solidarity and to apply peer pressure upon members who failed to fulfill their financial obligations. Unfortunately, being composed of farmers drawn from several villages, they generally reflected no traditional social reality, and had little cohesion.

In an effort to control production (and debt repayment) more effectively, SATMACI has encouraged production by collectives farming large estates subdivided into individual parcels. This permits close supervision by SATMACI agents. Economies of scale make modern farming techniques profitable (irrigation facilities and other infrastructures). Despite government support and the familiarity of forest zone farmers with commercial agriculture, the blocks have not been very successful.¹ Generally they are smaller than anticipated, and

¹See BETPA "Centre Ouest," annex 2, appendix 10, table 2. Cultivation on blocks is reminiscent of coercive colonial policy, and the memory still rankles. See Joseph J. Lauer, "Economic Innovations Among the Doo of Western Ivory Coast 1900-1960" (Ph.D. dissertation, University of Wisconsin, 1973), pp. 157-158.

less productive.

Private traders purchase cocoa from individual farmers and from collectives. The chief problems with this stage of the production process are unsatisfactory rural roads, and the role of moneylender that some traders assume. However, the marketing system functions quite effectively under logistically difficult conditions. The Stabilization Fund handles about seventy percent of international sales, and officially designated private merchants handle the remainder.

D. Evaluation: The Effects of Coffee and Cocoa Cultivation

The Impact on the Government. Since Independence, the government has obtained tremendous revenue from trade taxes on coffee and cocoa and from the Stabilization Fund's surpluses after coffee and cocoa sales. Over the fourteen year period 1963/64 to 1976/77, the Stabilization Fund lost money from sales of coffee and cocoa in only three years.¹ In 1975/76 and 1976/77 alone, the Fund's surplus from cocoa and coffee exceeded 100 billion CFA. Analyzing the period from 1960 to 1975, Lee (1980:22) found that farmgate prices averaged fifty-four percent of the FOB price in the case of coffee, and fifty-five percent of the FOB price for cocoa. The World Bank (1978:81) calculated that an average of roughly one-third of the coffee and cocoa FOB price went into government coffers during the period 1965/66 to 1974/75 (see table 62).

¹See World Bank, Ivory Coast, table SA38.

TABLE 62

DISTRIBUTION OF COFFEE AND COCOA FOB
PRICE AMONG FARMERS, MERCHANTS, AND
THE PUBLIC SECTOR 1965/66 TO 1974/75

	Average 1965-66 to 1974-75 (percent)	
	Cocoa	Coffee
Farmers	50%	54%
Traders, Transporters	12	15
Export Tax	22	16
Stabilisation Fund	16	15
FOB Price	100	100
Total Public Sector Share	38	31

Source: World Bank, Ivory Coast, p. 81; c.f. Lee, "Ivory Coast," p. 23.

In addition to increasing the Stabilization Fund's reserves, and providing the wherewithal for an elegant skyscraper in Abidjan, the surplus has bankrolled a major program of government investment during the latter 1970s, especially in the impoverished North. Lee (1980:23) notes, however, that during the period 1971-1975 approximately 79.5 billion CFA was transferred to the government from the agricultural sector. Total public sector revenue from agriculture amounted to 189.5 billion CFA, while public investment in agriculture was only 110 billion CFA.

The Impact on Smallholders. The impact of coffee and cocoa is in many respects the impact of forest zone commercial agriculture in general. Its effect on traditional farming systems varies. Pillet-Schwartz's (1973) fieldwork suggests that Ebrié farmers simply employed laborers for cash crops and maintained their traditional pattern of activities. Deniel (1976) found no change in the scheduling of activities in the agricultural calendar of the Ano that he could ascribe to coffee and cocoa. However, he cites Schwartz to the effect that the agricultural activities of the Guéré were extended over a larger portion of the year following the introduction of commercial crops, in order to even out the work load.¹

¹Alfred Schwartz, "Tradition et Changements dans la Société Guéré (Cote d'Ivoire)" (Paris, France: ORSTOM, 1971), p. 227; c.f. Deniel, Les Ano, p. 125. See also: Cleave, "Decisionmaking."

Guiké (1975) argues that commercial crops transformed the Alépé region from a food surplus region to a food deficit area. His scenario begins with (idyllic) subsistence agriculture, into which cash crops are introduced. Cultivating commercial crops reduces the land available for food crops; soil erosion and soil exhaustion ensue. Cash crops initially produce very low yields, since cultivation techniques remain archaic. As the soil deteriorates, all crops produce meagre harvests. To maintain their habitual schedule of activities, farmers hire expensive plantation laborers. Food crop production declines, net income from commercial crops is exceedingly low or even negative after the laborers have been paid, and farmers gradually become impoverished.

Stavenhagen (1975) documents the plight of the Agni as they were gradually displaced by more dynamic migrants. Their land tenure system became inoperative, and their authority over their own traditional realm dwindled under pressure from the influx of dynamic migrants. However, Stavenhagen found no evidence of soil exhaustion and increasing indigence. To the contrary, a fundamental aspect of commercial agriculture in the Agni region was the accumulation of unprecedented quantities of capital.

The magnitude of cocoa and coffee's impact upon traditional social structures is the subject of debate. Deniel (1976:57-58) contends that commercial agriculture has been assimilated into

traditional social relations among the Anó of the northeastern region of the forest zone. Deniel does recognize cases of strain, such as a household headed by a wealthy son even though his father resides there, but his conclusion is:

There is, thus, innovation. But traditional social relations are not radically affected by its dynamism. To the contrary: they utilize an innovation, they integrate it. The coffee huller (previously mentioned) is a good example of this integration: it was purchased with the money of the dependant, but bears the name of his protector --who, in exchange, pays the workers needed to operate it. In other words, this machine plays a dual role: it is a modern instrument of production, and also strengthens the fabric of traditional society.¹

The Bureau d'Etudes Techniques des Projets Agricoles' (1980) comprehensive study of the Center West of the Ivory Coast argues that traditional social relations (e.g., dowries) are still operative, but farmers now use modern goods for exchanges instead of traditional ones.²

Most writers, however, see cash crops as the stimulus for profound social change. The BETPA report just cited notes that in the Center West men control the marketing of cash crops. The implication is that cash cropping has widened the inequality of wealth and power between men and women. Stavenhagen (1975) argues that cash crops created

¹From Raymond Deniel, Une Société Paysanne de Côte d'Ivoire: Les Anó (Abidjan: INADES, 1976), p. 58.

²See BETPA, "Centre Ouest," Annex 1, p. 34.

four new and distinct classes in the Agni region of the Southeastern forest: small farmers who cultivate their own fields, a rural bourgeoisie who employ laborers to cultivate large holdings of cash crops, the laborers, and merchants who live in towns, purchasing farmers' commercial crops and selling them modern goods. The uneven cash flow from commercial crops, especially of coffee, has sparked the spread of money lenders. In one area Stavenhagen found that sixty percent of the farmers were in debt.

Stavenhagen (1975:160) and N'Guetta (1976) argue that forest cash crops have weakened the traditional authority of lineage heads and elders over juniors, who can now earn income on their own. Seka (1975:112) believes that the Attié have become more individualistic. Cash crops offer the enterprising individual the opportunity to become wealthy, and a key consequence of forest commercial agriculture is the emergence of a dynamic rural bourgeoisie.¹

The members of the new rural bourgeoisie are much wealthier and own much larger estates than their more traditional colleagues (see table 63). They employ more modern agricultural techniques than farmers with smaller holdings (see table 64), which presumably causes the statistically significant rise in productivity per agricultural worker as the size of landholdings increases (see table 65).

¹See Stavenhagen, "Agricultura Comercial," pp. 178-179.

TABLE 63

RURAL ECONOMIC DIFFERENTIATION: CASH CROPPING RECEIPTS AND TOTAL INCOME PER FARM
AND PER CAPITA BY SIZE OF LANDHOLDING IN THE SOUTHERN IVORY COAST 1978

Size of Landholding	Number of Farms	Average Number of Residents per Farm	Percent of Total Income in the Form of Auto-consumption	Percent of Total Income Coming from Receipts of Cash Cropping	Percent of Total Income Derived from Cash Sale of Food Crops
(1) 0.0- 1.99	130,800	4.5	70.5	15.1	14.4
(2) 2.0- 4.99	203,200	5.7	47.9	39.1	13.9
(3) 5.0- 9.99	150,200	7.1	34.0	55.3	10.6
(4) 10.0-19.99	58,400	10.6	27.9	65.8	6.2
(5) 20.0-99.99	13,900	13.6	16.7	81.7	1.6
Total	556,500				

Size of Landholding	Value of Cash Income per Capita (CFA)	Value of Cash Income per Farm (CFA)	Total Income per Capita (CFA)	Total Income per Farm (CFA)
(1) 0.0- 1.99	9,622	43,300	32,622	145,800
(2) 2.0- 4.99	25,000	142,500	48,000	273,600
(3) 5.0- 9.99	44,633	316,900	67,633	480,200
(4) 10.0-19.99	59,236	627,900	82,235	871,700
(5) 20.0-99.99	114,824	1,504,200	137,824	1,805,500

Source: Unpublished estimates of Direction du Plan, Côte d'Ivoire; c.f. Lee, "Ivory Coast," p. 18.

TABLE 64

RURAL ECONOMIC DIFFERENTIATION: UTILIZATION OF MODERN FARMING TECHNIQUES
BY SIZE OF LANDHOLDING IN THE IVORY COAST 1974/75

Size of Landholding	Percent of Farms Owning "Atomiseur"	Percent of Farms Owning "Pulverisateur"	Percent of Farms Owning "Decortiqueur Café"	Percent Using Tractors for Land Preparation	Average Number of Permanent Workers per Farm
0.5	-	-	-	1.8	0.1
0.5- 0.99	-	1.0	1.0	1.6	0.1
1.0- 1.99	1.0	1.0	1.0	1.2	0.1
2.0- 4.99	2.0	1.0	1.0	1.7	0.1
5.0- 9.99	11.0	2.0	3.0	0.7	0.4
10.0-19.99	22.0	6.0	6.0	1.7	1.2
20.0-49.99	37.0	18.0	17.0	1.1	3.2
50.0-99.99	40.0	21.0	33.0	33.0	7.5

Source: Census of Agriculture 1974/75; c.f. Lee, "Ivory Coast," p. 19.

TABLE 65

RURAL ECONOMIC DIFFERENTIATION: LABOR PRODUCTIVITY (HECTARES PER WORKER)
BY SIZE OF LANDHOLDING IN THE IVORY COAST 1974/75

Size of Landholding (ha)	(1) Average Size of Landholding (ha)	(2) Average Size of Household	(3) (1)÷(2) Average Hectarage per capita	(4) Average number of agriculturally Active Household Members	(5) Average Number of Permanent Laborers	(6) = (4)+(5) Total Number of Agricultural Workers	(7) = (1)÷(6) Hectarage per Agricultural Worker
0.0- 0.5	0.26	3.7	0.07	1.9	0.1	2.0	0.13
0.5- 0.99	0.76	4.8	0.16	2.3	0.1	2.4	0.32
1.0- 1.99	1.49	5.6	0.27	2.6	0.1	2.7	0.55
2.0- 4.99	3.37	6.5	0.52	3.0	0.1	3.1	1.09
5.0- 9.99	6.88	8.1	0.85	3.6	0.4	4.0	1.72
10.0-19.99	13.10	11.9	1.10	5.5	1.2	6.7	1.70
20.0-49.99	26.50	17.2	1.54	9.1	3.2	12.3	2.15
50.0-99.99	62.10	30.0	2.07	15.5	7.5	23.0	2.70

Source: Census of Agriculture 1974/75; c.f. Lee, "Ivory Coast," p. 20.

E. Evaluation: SATMACI's Role in the Coffee and Cocoa

Sectors

As an organization, SATMACI has not performed brilliantly. Although its workforce expanded, it is now declining. Despite a major reorganization, many problems--unpaid rural loans, farmers' disregard for extension guidelines, unreliable extension agents--persist. SATMACI's financial situation has been consistently unsatisfactory. The organization's greatest strength is its all purpose mandate, which makes it a useful means to many government goals. The government will probably continue to bail SATMACI out of its financial difficulties.

Since SATMACI's inception, hectarage and harvests of coffee and cocoa have doubled--a very satisfactory performance considering the magnitude of the increase (over a million hectares and roughly two hundred and fifty thousand tons of marketable beans). SATMACI, however, was directly responsible for only a small fraction of the expansion. During the period 1971-1975, SATMACI's programs accounted for only sixteen percent of the 584 thousand hectares of coffee and cocoa planted (see table 66). The tremendous post-independence spread of coffee and cocoa can only be ascribed in small measure to SATMACI's efforts.¹

¹This contrasts markedly with rubber, oil palm, sugar, and Allen cotton, which were planted almost exclusively under government auspices. Coffee and cocoa comprise about three-quarters of the total hectarage planted in plantation crops by the government during 1971-1975. This high proportion results partly from the termination of the massive oil palm planting campaign of 1965-1970.

TABLE 66

GOVERNMENT PLANTING AS A PERCENTAGE
OF TOTAL PLANTING OF SELECTED PLANTATION
CROPS 1971-1975

Crop	Area Planted by Government ^a (000 ha.)	Total Area Planted ^b (000 ha.)	Percent of Total Area Planted by Government
Coffee	37.0	308	12%
Cocoa	58.5	276	21
Rubber	4.7	4.9	96
Oil Palm	15.0	14.8	101
Coconut	8.5	13.4	64
Sugar	5.0	n.a.	n.a.
Total	128.7	622.1	21

a Source: World Bank, Ivory Coast, p. 418, table SA80.

b Source: Ministry of Agriculture, for the period 1971-1975, inclusive.

Considering how little of the total coffee and cocoa hectarage was properly planted with selected high yield hybrid stock, it is not surprising that Ivorian yields have risen very slowly. Even in areas that participated in SATMACI's programs, yields per tree and tree density per hectare are disappointingly low. In recent years, peasants' real income from coffee and cocoa has risen, but as a consequence of higher producer prices, not higher yields.

Paradoxically, these low yields result from the fact that coffee and cocoa are the only commercial crops that have been truly assimilated into traditional peasant farming systems. Persuading peasants to adopt modern cultivation techniques for crops that can be profitably grown with traditional methods is a particularly difficult task. To date, SATMACI has not made much headway. Thus, both in terms of increasing hectarage and raising yields, SATMACI's contribution to the Ivorian coffee and cocoa sectors has been minimal.

XIV. CONCLUSION

A clear pattern emerges from the case studies: to the extent agricultural parastatals lack autonomy from the government, they are crippled by volatile policies, organizational restructuring, and above all by unreliable funds. For crops that entail low financial stakes and that farmers cultivate spontaneously using traditional techniques, parastatals do not play an absolutely crucial role. Considerable organizational inefficiency can be tolerated without creating a catastrophe. For crops with high financial stakes whose cultivation requires smallholders to modernize their farming practices, the handicaps resulting from lack of parastatal autonomy spell disaster.

Private sector participation in the CFDT/CIDT and the SODEPALM Group was the base of their remarkable successes. Once the SODEPALM Group went fully public, its performance deteriorated rapidly. The Ivorian sugar industry, involving massive capital investment in overly sophisticated mills, has been an unmitigated failure. It helps neither the rural poor nor the national balance of payments. This debacle has been engineered by a fully public state corporation, SODESUCRE.

A finding of this study which has fundamental implications

for policy is the evidence that attractive agro-industrial development programs are pitfalls for governments which choose to design the programs as purely public sector endeavors. The West African public sector is unsuited to and lacks the technical expertise for large scale agro-industry.

However, programs for certain crops, notably coffee and cocoa, can feasibly be administered by purely public agricultural extension agencies. The financial stakes are low,¹ and the gradual process of modernizing cultivation techniques without any coercion has political merits that arguably outweigh the slow rate of economic development.

Ten factors are particularly important determinants of parastatal success and failure. These include sources of allocative efficiency and x-efficiency. They are:

Allocative Efficiency

1. Distortion in prices of inputs and outputs
2. The social value of resources allocated to a given sector.

X-Efficiency

1. Goals
2. Resources

¹SATMACI's movement towards hulling coffee in large mills raises the stakes in coffee and cocoa. It is a disquieting development.

3. Autonomy from the government
4. Critical dependencies
5. Technical constraints of crop production and processing
6. The diversity and difficulty of the target area
7. Farmers incentives to adopt a given crop
8. Parastatals' coercive leverage over participating farmers.

Allocative Efficiency. To the extent prices reflect goods' and services' marginal social opportunity costs, and investment incentives encourage resource allocation to activities with the maximum social benefit-cost ratio, parastatals and farmers will operate with allocative efficiency. This ideal state of affairs, however, rarely prevails. In West Africa, parastatals and farmers usually face severely distorted prices. Controlled exchange rates overvalue domestic currency, thereby subsidizing the purchase of expensive foreign equipment that can be imported duty-free. In response, many parastatals have embarked upon economically disastrous capital-intensive mechanized farming schemes. The Ivorian parastatal, SODESUCRE, and to a much lesser extent SODEPALM, have opted for over-sophisticated and costly equipment for their mills.

The prices of farmers' inputs and outputs are often distorted, since they tend to be set by administrative decree. Most West African governments pay their farmers an

artificially low producer price in order to maintain inexpensive urban food prices and to generate a government surplus from cash crop exports. Farmers' response has been to cut back on production and let their estates deteriorate. Ghana's degenerating cocoa farming sector eloquently testifies to this pattern. Despite implicit taxes on cocoa and coffee farmgate prices, producer prices in the Ivory Coast have exceeded those of neighboring West African nations, and offer Ivorian smallholders powerful monetary incentives for cash crop cultivation. The official producer price of rice is so high that the cost of milled Ivorian rice significantly exceeds world rice prices.

Ivorian farmers confront additional distorted incentives. Farmers planting coffee or cocoa under SATMACI's auspices receive a cash bonus to defray the costs of establishing an estate, while farmers planting oil palm do not. This subsidy has encouraged expansion of coffee and cocoa hectarage--a questionable goal, since the world markets for coffee and cocoa are saturated and additional production might not be marketable at a remunerative price. Oil palm planting, by contrast, has stagnated, which exacerbates the oil mills' problems of low capacity utilization. Low capacity utilization means high unit costs of production, which prevents the Ivory Coast from competing effectively in the price elastic international market for fats and oils.

In spite of the distorted incentives, Ivorian para-

statalts have generally allocated their resources efficiently. Except for mechanized rice and sugar, all the technical packages promoted have favorable domestic resource costs. A surprisingly wide range of allocative inefficiencies created by distorted prices and incentives appears to be tolerable.

X-Efficiency. Parastatalts and farmers jointly produce a marketable agricultural commodity. They confront the constraints of producing a given crop with certain goals, resources, and critical dependencies. The most important dependency for the farmer is usually on the parastatal; for the parastatal the key dependency is on the government.

X-efficient operation requires organizational goals that are clear, stable, and harmonious. For example, the SODEPALM Group's legal division between SODEPALM-Rural-Development and SODEPALM as a member of the Group explicitly separated social welfare and financial goals. The Group's goals remained stable and relatively narrow (confined to the vertically integrated production of palm oil and to raising the welfare of the participating peasantry). Most parastatalts' goals, however, are vague, shifting, and are composed of conflicting social welfare and financial objectives.

Agricultural parastatalts vary tremendously in their ability to command key resources: political power, monetary

funding, trained manpower, and organizational stability. The more resources an organization controls, the more autonomous it is.

Parastatals' autonomy from the central government has three aspects: geographical, financial, and legal. Without substantial autonomy, parastatals are likely to suffer a series of shocks from the government in the form of rapid policy changes, organizational restructuring, unreliable funding, and interference in day-to-day decisionmaking.

To carry out their tasks, agricultural parastatals depend upon other organizations and smallholders for: research and development; extension, construction and land clearing; distribution of inputs; cultivation; purchase and transport of the harvest; processing; and marketing. To the extent that an agricultural agency controls each stage of the production process, it can ensure satisfactory performance. Agricultural parastatals in the Ivory Coast depend upon specialized organizations for agricultural research and development and for international marketing. The private sector has efficiently carried out some intermediate steps (cultivation, purchase and transport, processing), but the public sector has been notoriously unreliable in this respect (e.g., SODEPALM's experience with MOTORAGRI).

The technical constraints of different crops vary widely. Five factors are crucial: (1) the complexity of the inputs required to cultivate the crop, and the crop's

sensitivity to variations in the inputs; (2) the control the farmers and parastatals exert over inputs; (3) the time lag before the consequence of a change in inputs manifests itself; (4) the financial stakes involved in producing a marketable commodity; and (5) the stability and profitability of world prices.

Crops that entail high stakes should be adopted only if production has low risks. Either the variety of the crops grown must be insensitive to changes in cultivation inputs or the parastatal and farmers must exert rigid control over the inputs. Projects for crops whose prices fluctuate require large cash buffers against variations in their cash flow.

Parastatals' target regions contain geographical, administrative, infrastructural, and human diversity. To cope with the diversity, parastatals must create either multiple administrative units or technical packages, or confine their activities to a subsector of the target. Cultural and socioeconomic diversity exists within all Ivorian parastatals' zones of action, but to the author's knowledge no West African parastatal has developed programs tailored to different tribes and/or socio-economic strata. The usual strategy is to neglect areas that resist agricultural innovations.

Smallholders play a key role in most agricultural parastatals' schemes. Farmers' incentives to adopt crops

are chiefly: (1) the profitability of the crop relative to alternative sources of revenue; (2) the labor requirements of the crop; and (3) the availability of adequate subsistence crops.¹ Once smallholders enroll in an agricultural program, parastatals possess two chief sources of coercive leverage: monopoly of cultivation inputs and monopoly of purchasing farmers' harvests. Parastatals that hold no coercive leverage over farmers have had difficulty ensuring compliance with cultivation guidelines.

Parastatals structured appropriately for their tasks can significantly contribute to national development, while poorly designed parastatals are likely to constitute serious hindrances. Awareness of the factors determining parastatal success permits policymakers to select the most effective organizational form to implement their goals.

West African nations have implicitly distrusted the private sector, especially as an agent of rural development. This study's findings suggest that this position should be tempered: the private sector is a key ingredient in successful state agro-industry. The poor performance of parastatals is a result of governments' failure to design them to suit their tasks, and not of any intrinsic weakness in the parastatal organizational form. The profound problems

¹For a fuller listing of crop production from the farmers' viewpoint, see pp. 47-53.

which have plagued agricultural parastatals in the past should not obscure their tremendous potential: they remain a viable and important path to rural development in West Africa.

APPENDIX I
LIST OF ACRONYMS

ARSO	Autorité pour Aménagement de la Région du Sud-Ouest (Development Authority for the Southwest Region)
AVB	Autorité pour Aménagement de la Vallée du Bandama (Bandama Valley Authority)
BCEAO	Banque Centrale des Etats d l'Afrique de l'Ouest (Central Bank)
BDPA	Bureau pour le Développement de la Production Agricole
BETPA	Bureau d'Etudes Techniques des Projets Agricoles
BIAO	Banque Internationale pour l'Afrique Occidentale
BICICI	Banque Internationale pour le Commerce et l'Industrie de la Côte d'Ivoire (International Bank for Commerce and Industry of the Ivory Coast)
BNDA	Banque Nationale pour le Développement Agricole (National Agricultural Development Bank)
BNETD	Bureaux Nationaux d'Etudes Techniques et de Développement (National Offices for Technical and Development Studies)
BOAD	Banque Ouest Africaine de Développement (West African Development Bank)
BSIE	Budget Special d'Investissement et d'Equipement (Investment Budget)
CAA	Caisse Autonome d'Amortissement (Debt Amortization Fund)
CAPRAL	Cocoa processing corporation
CCCE	Caisse Centrale de Cooperation Economique (Central Fund for Economic Cooperation)

CGPPPGC	Caisse Générale de Péréquation des Prix de Produits
CEIB	Centre d'Elevage Industriel du Bétail
CEDAR	Centre d'Etudes pour le Développement de l'Arabusta (Arabusta research center)
CENAPEC	Centre National de la Promotion des Entreprises Coopératives (National Center for the Promotion of Cooperatives)
CFDT	Compagnie Française pour le Développement des Fibres Textiles (French Company for the Development of Textile Fibers)
CIDT	Compagnie Ivoirienne pour le Développement des Textiles (Ivorian Textile Development Company)
CIRES	Centre Ivoirien de Recherche Economique et Sociale
COFRUCI	Fruit marketing cooperative
CRZ	Centre de Recherche Zoologique
CSSPPA	Caisse de Stabilisation et de Soutien des Prix de Produits Agricoles (Stabilization Fund)
CTFT	Centre Technique Forestier Tropical (Technical Center for Tropical Forestry)
DATAR	Direction de l'Aménagement du Territoire et de l'Action Régionale (French Regional Development Agency)
DGDA	Direction Générale du Développement de l'Agriculture (Directorate General of Agricultural Development)
FAC	Fonds d'Aide et de Coopération (French Aid and Cooperation Fund)
FED	Fonds Européen de Développement (European Development Fund)
FNI	Fonds National d'Investissement (National Investment Fund)
FOB	Free on board

FOREXI	Société pour la Réalisation de Forages d'Exploitation en Côte d'Ivoire
FRAR	Fonds Régionaux d'Aménagement Rural (Regional Rural Development Funds)
IDESSA	Institut des Savanes
IFCC	Institut Français pour le Café et le Cacao (French Institute for Coffee and Cocoa)
IRAT	Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières (Institute for Research in Tropical Agriculture and Foodcrops)
IRCA	Institut de Recherches sur le Caoutchouc
IRCT	Institut de Recherches du Coton et des Fibres Exotiques (Institute for Research on Cotton and Exotic Fibers)
IRHO	Institut de Recherches des Huiles et Oléagineux (Institute for Research on Edible Oils and Oleaginous Products)
ITIPAT	Institut pour la Technologie et l'Industrialisation des Produits Agricoles Tropicaux
ITT	Institut de la Technologie Tropicale (Institute of Tropical Technology)
JORCI	Journal Officiel de la République de Côte d'Ivoire (Official Journal of the Ivory Coast)
MOTORAGRI	Société pour le Développement de la Motorisation de l'Agriculture (Company for the Development of Agricultural Motorization)
OCPA	Office pour la Commercialisation des Produits Agricoles
ONFP	Office National de Formation Professionnelle (Office of Professional Training)
ONPR	Office National de Promotion Rurale (National Office for Rural Development)
OPT	Post office and telecommunications
ORSTOM	Office de la Recherche Scientifique et Technique d'Outre-Mer (Office of Overseas Scientific and Technical Research)

RAN	Régie du Chemin de Fer Abidjan-Niger (Abidjan-Niger Railroad)
SALCI	Société des Ananas de Côte d'Ivoire
SAPH	Société Africaine de Plantations d'Hévéas
SATMACI	Société d'Assistance Technique pour le Modernisation Agricole de la Côte d'Ivoire (Technical Assistance Company for the Agricultural Modernization of the Ivory Coast)
SERIC	Société d'Etudes et de Réalisations pour l'Industrie Caféière et Cacaoyère
SETU	Société d'Equipment des Terrains Urbains
SGBCI	Société Générale de Banque en Côte d'Ivoire
SIB	Société Ivoirienne de Banque
SICOFREL	Société Ivoirienne pour la Commercialisation de Fruit et Légumes
SITAB	Société Ivoirienne de Tabac
SOCATCI	Société des Caoutchoucs de Côte d'Ivoire (Ivory Coast Rubber Company)
SOCIPEC	Société Ivoirienne de Participation Economique
SODE	Société de Développement (Development Company)
SODEFEL	Société pour le Développement des Fruits et Légumes (Fruit and Vegetable Development Company)
SODEFOR	Société pour le Développement des Plantations Forestières (Forestry Development Company)
SODEMI	Société pour le Développement Minier en Côte d'Ivoire (Ivory Coast Mining Development Company)
SODEPALM	Société pour le Développement et l'Exploitation du Palmier à l'Huile (Oil Palm Development Company)
SODEPRA	Société pour le Développement des Productions Animales (Livestock Production Development Company)

SODERIZ	Société pour le Développement de la Riziculture (Rice Development Company)
SODESUCRE	Société pour le Développement des Plantations de Cannes à Sucre, l'Industrialisation et Commercialisation du Sucre (Sugar Development Company)
SOGB	Société Générale de Grand Béréby
SOGESCOL	Multinational corporation dealing in edible oils
SONACO	Société Nationale de Conditionnement
SONAFI	Société Nationale de Financement (National Finance Company)

Primary Sources: World Bank, Ivory Coast, pp. xiv-xviii;
Dutheil de la Rochère, L'Etat et le
Développement, pp. xxi-xxiv.

APPENDIX II
IMPORTANT AGRICULTURAL
PARASTATALS IN THE IVORY COAST 1980

ARSO	Autorité pour l'Amenagement de la Region du Sud-Ouest
AVB	Autorité pour l'Amenagement de la Vallée du Bandama
BETPA	Bureau d'Etudes Techniques des Projets Agricoles
BNDA	Banque Nationale pour le Développement Agricole
BNETD	Bureaux Nationaux d'Etudes Techniques et de Développement
CEIB	Centre d'Elevage Industriel du Bétail
CIDT	Compagnie Ivoirienne pour le Développement des Textiles
CIRES	Centre Ivoirien de Recherche Economique et Sociale
CRZ	Centre de Recherche Zoologique
CSSPPA	Caisse de Stabilisation et de Soutien des Prix de Produits Agricoles
CTFT	Centre Technique Forestier Tropical
FOREXI	Société pour la Réalisation de Forages d'Exploitation en Côte d'Ivoire
IDESSA	Institut des Savanes
IFCC	Institut Français pour le Café et le Cacao
IRAT	Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières
IRCA	Institut de Recherches Sur le Caoutchouc

IRCT	Institut de Recherches du Coton et des Fibres Exotiques
IRHO	Institut de Recherches des Huiles et Oléagineux
ITIPAT	Institut pour la Technologie et l'Industrialisation des Produits Agricoles Tropicaux
ITT	Institut de la Technologie Tropicale
MOTORAGRI	Société pour le Développement de la Motorisation de l'Agriculture
OCPA	Office pour la Commercialisation des Produits Agricoles
ONPR	Office Nationale de Promotion Rurale
ORSTOM	Office de la Recherche Scientifique et Technique d'Outre-Mer
PHCI	Plantations d'Hévéa de Côte d'Ivoire
SALCI	Société des Ananas de Côte d'Ivoire
SAPH	Société Africaine de Plantations d'Hévéas
SATMACI	Société d'Assistance Technique pour le Modernisation Agricole de la Côte d'Ivoire
SERIC	Société d'Etudes et de Réalisations pour l'Industrie Caféière et Cacaoyère
SICOFREL	Société Ivoirienne pour la Commercialisation des Fruits et Légumes
SITAB	Société Ivoirienne de Tabac
SODEFEL	Société pour le Développement des Fruits et Légumes
SODEFOR	Société pour le Développement des Plantations Forestières
SODEPALM	Société pour le Développement et l'Exploitation du Palmier à Huile
SODEPRA	Société pour le Développement des Productions Animales
SODESUCRE	Société pour le Développement des Plantations de Cannes à Sucre, l'Industrialisation et Commercialisation du Sucre

SOGB Société de Grand Béréby

SONACO Société Nationale de Conditionnement

APPENDIX III

EXPERTS ON AGRICULTURAL PARASTATALS

Research conducted by the individuals and institutions below is listed in the bibliography. There are few experts on agricultural parastatals, so this appendix includes experts in closely related fields.

Experts on Agricultural Parastatals

Blume, Hans

Jiggins, Janice

Ruthenberg, Hans

Experts on Agricultural Administration

Adeyokunnu, Tomilayo O.

Akinbode, I. A.

Arua, Emea O.

Bureau pour le Développement de la Production Agricole.

Chambers, Robert

de Wilde, John C.

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Ogunfowora, O.

Waldstein, Abraham S.

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Experts on Parastatals

Centre Africain de Formation et de Recherche Administrative
pour le Développement

Commonwealth Secretariat

Gillis, Malcolm

Harvard Institute for International Development

Jenkins, Glenn P.

Jones, Leroy

Maniatis, George G.

Marris, Robin

Phatak, Arvind

Sheahan, John B.

Simba, Iddi

Soyode, A.

Udoji, J. O.

United Nations, Department of Economic and Social Affairs

Experts on Parastatals in West Africa

Bernard, Michel

Centre d'Etudes de l'Afrique Noire, Université de Bordeaux,
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Constantin, F.

Coulon, C.

Diabaté, Mustapha

Dutheil de la Rochère, Jacqueline

Gautron, Jean-Claude

Grosdidier de Matons, Jean

Laugier

Experts on Parastatals in West Africa continued.

Lavroff, Dmitri-Georges

Ministère pour la Reforme des Sociétés d'Etat, Abidjan

Parot, Francis

Tay, Hugues

Zuber, Bernard

Experts on Specific Agricultural Parastatals in the Ivory Coast

Bureau d'Etudes Techniques des Projets Agricoles

Dozon, Jean-Pierre

Lassailly, Veronique

N'Guetta, Kouadio N.

Peltre-Wurtz, Jacqueline

Pillet-Schwartz, Anne-Marie

Schwartz, Alfred

Steck, Benjamin

Talon, Jean-François

APPENDIX IV

ANNOTATED BIBLIOGRAPHY OF THE MOST RELEVANT LITERATURE ON AGRICULTURAL PARASTATALS

Adeyokunnu, Tomilayo O. "Designing Rural Development Projects: Some Lessons from the Nigerian Experience." Agricultural Administration vol. 6, no. 1 (January 1979):11-18.

The insights in this article are unremarkable, but it is sensible and contains trenchant anecdotes of both successful and disastrous agricultural development schemes in Nigeria.

Blume, Hans. Organisational Aspects of Agro-Industrial Development Agencies; Nine Case Studies in Africa (Tea, Cotton, Oil-Palm). ITS Afrika Studien no. 58. Munich, Federal Republic of Germany: Weltforum Verlag, 1971.

Blume's excellent book is not about agricultural parastatals per se, but most of the development agencies he investigates are, in fact, parastatals. He analyzes their viability in terms of the size and duration of the agency's capital investment, and the division of labor between agency and farmer. Blume contends that investment and division of labor are to some extent policy options, but are also determined by the technical requirements of the crop being produced.

Chambers, Robert. Managing Rural Development: Ideas and Experience from East Africa. Uppsala: The Scandinavian Institute for African Studies, 1974.

Chambers analyzes the administrative difficulties encountered by rural development agencies. His description of mismanaged agricultural extension programs is of particular interest.

de Wilde, John C., et al. Experiences with Agricultural Development in Tropical Africa. 2 vols. Baltimore, Maryland: Johns Hopkins University Press, 1967.

These two volumes constitute the classic World Bank analysis of tropical African agricultural development. The authors cover ecology, traditional farming practices, rural society, the economics of smallholder farming, alternative technical packages, land tenure and use, agricultural extension programs, credit, marketing, and cooperatives. Volume II presents case studies in Kenya, Mali, Uganda, Tanzania, Upper Volta, Chad, and the Ivory Coast. Volume I synthesizes the case studies' conclusions.

Dozon, Jean-Pierre. "Impasses et Contradictions d'une Société de Développement: l'Exemple de l'Opération 'Riziculture Irriguée' en Côte d'Ivoire." Cahiers O.R.S.T.O.M., Séries Sciences Humaines, vol. 16, nos. 1-2 (1979): 37-58.

This is a good case study on the impact of an Ivorian parastatal, SODERIZ, in the region of Gagnoa. It is possible to cultivate rice, cotton, or coffee in this area, and Dozon found that the parastatals responsible for the different crops competed with each other to enroll the maximum number of peasants in their respective programs. SODERIZ's irrigated rice program enriched only the wealthier peasants who could mobilize extra labor. Dozon considers this a natural consequence of SODERIZ's primary goal, which was raising rice production, not rural welfare.

Dutheil de la Rochère, Jacqueline. L'Etat et le Développement Economique de la Côte d'Ivoire. Série Afrique Noire no. 6. Paris: Edition A. Pedone, 1976.

Agricultural parastatals function within a complex institutional environment. Dutheil de la Rochère's comprehensive study of state intervention in the economic development of the Ivory Coast is the most complete overview available of a West African nation's public and parastatal sectors.

Gillis, Malcolm. "Efficiency in State Enterprises: Selected Cases in Mining from Asia and Latin America." Discussion Paper no. 27. Cambridge, Mass.: Harvard Institute for International Development, April 1977.

Gillis' case studies of parastatal efficiency are the most analytically sophisticated in the literature the author has reviewed. Gillis focuses on industrial parastatals, but his approach is equally valid for agricultural parastatals.

Hunter, Guy. The Implementation of Agricultural Development Policies: Organisation, Management, and Institutions. London: Overseas Development Institute, Ltd., 1974.

This is a lucid introductory survey of the basic managerial issues involved in implementing agricultural programs.

Jenkins, Glenn P. "Performance Evaluation and Public Sector Enterprises." Discussion Paper no. 46. Cambridge, Mass.: Harvard Institute of International Development, 1978.

Jenkins advocates the use of social cost-benefit analysis for assessing the performance of public sector enterprises. He painstakingly demonstrates the steps required for such an assessment.

Jiggins, Janice. "Regional Alternatives to Ministries of Agriculture: Agricultural Development Projects in Malawi, Nigeria, and Ghana." Agricultural Administration vol 6, no. 1 (January 1979): 89-97.

This is a careful description of three African parastatals implementing integrated rural development programs. Governments turned to these autonomous parastatals due to frustration with ineffective Ministries of Agriculture. However, the parastatals have encountered difficulties of their own, both with farmers and with other agencies.

Jones, Leroy. Public Enterprise and Economic Development. Seoul, Korea: Korea Development Institute, 1975.

This is an interesting formal approach to classifying parastatals along a variety of dimensions.

Lele, Uma. The Design of Rural Development: An Analysis of Programs and Projects in Africa. Baltimore, Maryland: Johns Hopkins University Press, 1975.

Lele reviews rural development programs throughout tropical Africa. She ascribes their limited effectiveness in raising the welfare of the low-income rural population to several factors. First, many programs were not designed as integrated rural development programs targeted on the rural poor. Second, many technical packages were unsuited to rural ecology, farming systems, and social structures. Institutional problems and shortages of trained manpower further handicapped the development programs. Given these past constraints, Lele suggests either concentrating scarce trained manpower in a few priority projects, or relying on pilot projects to indicate successful rural development strategies. This is an excellent and thought-provoking book. It includes a chapter on "autonomous projects."

Leonard, David K. Reaching the Peasant Farmer: Organization Theory and Practice in Kenya. Chicago: University of Chicago Press, 1977.

Leonard explicitly utilizes organizational theory to analyze the problems of agricultural extension in Kenya. He finds that extension agents who know each other well tacitly maintain a common low level of effort.

Linn, Johannes F. "Economic and Social Analysis of Projects: A Case Study of the Ivory Coast." World Bank Staff Working Paper no. 253. Washington, D.C.: World Bank, May 1977.

To demonstrate the World Bank approach to social cost-benefit analysis, Linn analyzes three projects in the Ivory Coast. After developing the elaborate framework required for the calculations, Linn examines the Grand Béréby Rubber Estate Project (1973) and the Cocoa Smallholders Project (1978). Both of these turn out to be socially profitable endeavors.

Maniatis, George G. "Managerial Autonomy in Public Enterprises: Fact and Anti-Fact." Annals of Public and Cooperative Economy vol. 39, no. 4 (October 1968): 513-530.

Maniatis contends that public enterprises function most efficiently when the government utilizes a particular form of supervision. The Minister overseeing the enterprise should define its goals, while the board of directors should select the means to attain the goals. The chief executive officer should hold considerable latitude in executing the board's directives. In essence, this structure encourages both allocative efficiency and x-efficiency.

Marris, Robin. "The Comparative Efficiency of Public Enterprises: A Survey of the Literature." Washington, D.C.: World Bank, February 1978.

Based on a huge literature search, Marris has produced the best analytical survey of parastatal efficiency available. Perhaps his most important conclusion is that, except for the work of Gillis, none of the material utilized a rigorous concept of efficiency.

Peltre-Wurtz, Jacqueline, and Steck, Benjamin. "Influence d'Une Société de Développement sur le Milieu Paysan; Coton et Culture Attelée dans la Région de la Bagoué." Abidjan: Office de la Recherche Scientifique et Technique Outre-Mer, and Compagnie Ivoirienne de Développement des Textile, 1979.

This is the most detailed assessment in the literature on an agricultural parastatal's impact on a rural population. Examining the effect of the CIDT's cotton program on Ivorian farmers, Peltre-Wurtz and Steck found significant alteration in farming systems. However, these changes had little effect on rural economic stratification.

Phatak, Arvind. "Government Interference and Management of Public Sector Firms." Annals of Public and Cooperative Economy vol. 40, no. 3 (July-September 1969).

Phatak documents the managerial woes of public enterprise in India. Rapid turnover of board members is a particularly acute problem.

Pillet-Schwartz, Anne-Marie. "Capitalisme d'Etat et Développement Rural en Côte d'Ivoire; La Société pour le Développement et l'Exploitation dy Palmier à Huile en Pays Ebrié." Dissertation for 3^e Cycle, Ecole Pratique des Hautes Etudes, 1973.

An exhaustive study of SODEPALM's activities in the Ebrié region, this study concludes that a disproportionate share of the sums SODEPALM channeled to the rural population went to hired plantation laborers and urbanites who owned relatively large rural plantations.

Ruthenberg, Hans. "The Adaptation of Agricultural Production Services to Changing Circumstances: Some Considerations Based on the Experience with Projects in Tropical Africa." Agricultural Administration vol. 4, no. 2 (April 1977): 131-148.

Ruthenberg hypothesizes that agricultural parastatals are appropriate for intensive projects, clearly limited in time and space, whose goal is to propagate a simple and highly profitable set of innovations. Departments of Agriculture are best suited to long-term extension programs attempting to introduce innovations which are technically demanding, expensive, and relevant only to a fraction of farmers in an area. His discussion of the transition from an intensive program to a program aimed at maintaining the gains already achieved is particularly interesting.

Schwartz, Alfred. "La Dimension Humaine des Grande Opérations de Développement; L'Exemple de l'Opération San Pedro (Sud-Ouest de la Côte d'Ivoire)." L'Espace Géographique no. 1 (1979): 65-70.

Schwartz documents the negative impact on the peasantry of the government's well-intentioned economic development programs in the Ivorian Southwest.

Simba, Iddi. "The Public Enterprise as a Development Unit: The African Experience." In The Role and Management of Public Enterprises, pp. 143-157. London: Commonwealth Secretariat, n.d.

Simba discusses African public enterprises in general. He sees them as a useful way to ensure allocative efficiency, since private enterprise may leave national resources untapped and may even work against society's best interests.

Talon, Jean-Francois. "Le Groupe SODEPALM." Thesis for Diplome d'Etudes Supérieures de Droit Public, University of Abidjan, October 1972.

Talon's analysis is primarily descriptive and includes a great deal of legal material. Although it is a useful investigation of SODEPALM as a formal organization, Talon does not examine the informal side of the organization, and disregards the impact of SODEPALM's activities on the rural farming population and on the national economy.

Waldstein, Abraham S. "Government Sponsored Agricultural Intensification Schemes in the Sahel: Development For Whom?" U.S.A.I.D. Papers on Social Development Series. Washington, D.C.: United States Agency for International Development, August 1978.

This scathing condemnation of large scale agricultural schemes finds they serve the interests of government bureaucrats and international aid donors more than those of the peasants.

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